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ABSTRACT

This publication is the second annual description of data examining the educational, employment, and independent living outcomes attained by youth with handicaps as they exit school and enter the work force. The publication contains tables and figures presenting data on the percentages of youth served by handicapping condition at the state level for four age cohorts (3-5, 6-11, 12-17, and 18-21). In addition, the "High School and Beyond" (HSB) database is used to portray comparisons of independent living and employment rates for youth with and without handicaps, and to depict differences among six specific handicapping condition groups. An introduction to the secondary analysis of extant data sources is provided. The development of a district-based longitudinal study of special education graduates is outlined, focusing on what students do after leaving school, the types of jobs they obtain, and parts of the special education program contributing to their successful transition. The development and analysis of a set of independent living scales is also described, based on the HSB database, and the relationships of independent living with employment, educational outcomes, and demographic factors are determined. References accompany each chapter. Appendices contain supporting data and details concerning the research methodology. (JDD)

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ED318163

Digest on Youth in Transition

Volume 2

Delwyn L. Harnisch
Adrian T. Fisher

EC 230565

TRANSITION INSTITUTE AT ILLINOIS

The following principles guide our research related to the education and employment of youth and adults with specialized education, training, employment, and adjustment needs.

- Individuals have a basic right to be educated and to work in the environment that least restricts their right to learn and interact with other students and persons who are not handicapped.
- Individuals with varied abilities, social backgrounds, aptitudes, and learning styles must have equal access and opportunity to engage in education and work, and life-long learning.
- Educational experiences must be planned, delivered, and evaluated based upon the unique abilities, social backgrounds, and learning styles of the individual.
- Agencies, organizations, and individuals from a broad array of disciplines and professional fields must effectively and systematically coordinate their efforts to meet individual education and employment needs.
- Individuals grow and mature throughout their lives requiring varying levels and types of educational and employment support.
- The capability of an individual to obtain and hold meaningful and productive employment is important to the individual's quality of life.
- Parents, advocates, and friends form a vitally important social network that is an instrumental aspect of education, transition to employment, and continuing employment.

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Digest on Youth in Transition

Volume 2

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Preface

This is the second in a series of annual descriptions of data examining the educational, employment, and independent living outcomes attained by youth with handicaps as they exit school and enter the work force. This book will be referred to as Volume 2 of the *Digest on Youth in Transition.* This *Digest* represents analyses conducted with two major data sources. Each year additional analyses will be performed to consider the current information and emerging trends in longitudinal data bases.

This publication contains a variety of tables and figures presenting data on the percentages of youth served by handicapping condition at the state level for the four age cohorts (3-5, 6-11, 12-17, and 18-21). In addition, characteristics of youth with and without handicaps, as provided in the *High School and Beyond* (HSB) data base, are used to portray comparisons of independent living and employment rates for youth with and without handicaps, and also depict salient differences among six specific handicapping condition groups regarding their independent living and employment outcomes. An introduction to the secondary analysis of extant data sources is provided in Chapter 1. Chapter 2 provides tables and figures describing the percentage of youth served by handicapping condition based on the data provided by the *Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act.* Profiles of youth with handicaps served are given by each state for each of the four age cohorts. Chapter 3 outlines the development of a district-based longitudinal study of special education graduates. Chapter 4 addresses post-school employment patterns by handicapping

condition and graduation status. Chapter 5 outlines the development and analysis of a set of independent living scales based on the HSB data set. Chapter 6 extends these analyses and examines the relationships of independent living with employment, educational outcomes, and demographic factors. Finally, Chapter 7 presents a summary of the major findings in the *Digest*.

During the past decade several federal funding initiatives have encouraged the emergence of a wide variety of secondary and postsecondary activities designed to prepare individuals with special learning needs to enter the work force and the adult community. Efforts have been made to improve school curricula by emphasizing the need to prepare people with disabilities to complete their education and to become productive members of society.

Improvements in the nature and extent of services for persons with disabilities have recently been reported by several agencies. However, a close look at empirical sources and at current conditions in our society will disclose that we have only partially achieved the true integration into our society of persons with disabilities. The efforts represented by the editors and chapter authors reflect the concern we have for making the public aware of the employment and independent living outcomes for youth with handicaps.

Appendixes A and B contain the state level data on frequency by handicapping condition of youth served. Calculations were based on the U.S. Department of Education Office of Special Education and Rehabilitative Services' *Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act,* Tables GA3, GA4, GA5, and GA6, 1986. Appendix C outlines the interpretation of box plots as a means of summarizing data. Appendix D contains the instructions given to the experts describing how the HSB items should be sorted into the areas of independent living. Appendix E summarizes the items selected for use in the scales of independent living. Appendix F describes a number of the measures used in this study and how they were developed from the HSB data set.

Summary of Methodology

Basic descriptive statistics are used to describe the percentage of youth with handicaps served by the Education of the Handicapped Act. Changes in percentages of youth served from the school years to the post-school years were examined for each of the handicapping conditions. Box plots were used to display the different percentages of youth served for three handicapping conditions for these four age cohorts.

Graphical displays such as horizontal bar charts were used along with tables to summarize the data. Box plots were also used to represent the distributions of scores for the various groups under study. Appendix C provides more information about the use and interpretation of box plots.

Caveats

The displays and tables are descriptive in that no particular theories are presented to explain the observed trends. In addition to being largely free of theory, the tables and figures are without value judgments and without advocacy of any policy changes. The accuracy and reliability of the basic data, and the consistency of the population from which the basic data are obtained, are not the same for all statistics. For example, the sample represented in *High School and Beyond* was based on self-reported data, while the data presented in the *Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act* data base are from state education offices. It is hoped that, with the introductory notes at the beginning of each chapter and the discussion of these displays, these descriptive profiles and breakdowns of outcome data will advance our understanding of the characteristics of youth with handicaps in transition.

Acknowledgments

The successful production of an edited book depends upon the efforts of many individuals, especially the chapter authors. The contributing authors have described innovative, practical, and creative analyses for us to understand better the transition to work for persons with disabilities. The contributions to this monograph as well as to their respective fields are acknowledged and appreciated.

We wish to thank Jeff Owings at the National Center for Educational Statistics for his helpful comments on the organization of the *High School and Beyond* files. We also wish to thank Lou Danielson and his staff from the Office of Special Education and Rehabilitative Services(OSERS) who produced the *Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act.*

Finally, we wish to note that this work was partially supported by the Research Board of the University of Illinois at Urbana-Champaign which provided for computer-related expenses. Most of the analyses presented in this report were prepared using the Statistical Analysis System(SAS) on the IBM 3081-GX.

Delwyn L. Harnisch

1

Introduction to Secondary Analysis of Extant Data Sources

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In the United States, the transition to adulthood is not marked by a single event of passage. It is a process whereby youth take on an increasing number of the rights and reponsibilities of adults. The process begins in adolescence and continues for varying periods of times in the lives of individuals. Laws establish maximum ages of children at which parents are responsible for and have control over them and minimum rights to leave school, drive a car, vote, be employed, drink alcoholic beverages, enter the military, and marry. However, not all behavior during this period is governed by laws. For example, there are no minimum ages at which youth acquire the rights to smoke, become sexually active, or become parents. Considerable variations exist in the ages at which these changes are experienced. For example, the ages of leaving school, entering the work force, and marrying tend to be well above the legal ages at which these changes are possible.

It has been estimated that there are about 4,113,312 children and youth through age 21 enrolled in education programs for students with handicaps in the United States(*Eighth Annual Report* , 1986). Approximately 341,340 youths with handicaps leave high school each year, the majority of whom are faced with unemployment and underemployment. Currently, despite our improved public awareness and significant improvements in the educational and adult service systems for persons with handicaps, hundreds of thousands of these potentially employable individuals remain idle. Unemployment rates vary between 50 and 75% among persons with disabilities, and a 67% unemployment rate for Americans with handicaps was found in 1986 by a Harris telephone survey with a cross section of 1,000 persons with handicaps 16 years of age and over.

Recently, the U.S. Commission on Civil Rights (1983) reported that between 50% and 80% of all persons with disabilities are unemployed. These data suggest that a disproportionately large number of persons with disabilities do not obtain meaningful jobs. Several follow-up studies conducted in Vermont (Hasazi, Gordon, & Roe, 1985), Virginia (Wehman, Kregel, & Zoller, 1984), Colorado (Mithaug & Horiuchi, 1983), and Washington (Edgar & Levine, 1986) reflect similar figures. Based on findings, it appears that--in spite of considerable recent attention focused on elementary and secondary education-- meaningful employment benefits for graduating students who are disabled have not been realized. Although several million individuals with disabilities in this country are denied, for various reasons, the opportunity to engage in meaningful employment, these individuals do possess the potential to live and work in the community. These individuals have been the focus of attention by special educators, vocational educators, vocational rehabilitation personnel, adult service agencies, and many other agencies and organizations for the past three decades. Unfortunately, many individuals with retardation, physical disabilities, or other disabilities have not made a successful transition to the community. Most of them work in sheltered settings, are underemployed, or are unemployed and live with family, relatives, or friends without much hope of participating in their community in the manner in which most nondisabled persons participate. There is considerable evidence to suggest that these youth will not make gains in the world of work

unless there is a concerted effort to identify and introduce interventions that will lead to their employment.

The Transition Institute is designed to address both the theoretical and practical problems of transition from school to work for youth with handicaps. The Transition Institute grew out of a consensus among legislative, professional, and advocacy organizations that an initiative was needed to establish a more systematic and effective delivery system to assist youth with handicaps in making the transition from school or unemployment to work. The passage of Public Law 98-199 provided the authority to address this need specifically through Section 626, entitled "Secondary Education and Transition Services for Handicapped Youth." The mission of the Transition Institute is threefold: it will address a series of evaluation, technical assistance, and research activities.

Review of Extant Data Sources

One of the major tasks of the evaluation program of the Transition Institute entails examining the educational, employment, and independent living outcomes attained by youth with handicaps as they leave school and enter the work force. Federal, state, and local data sources as well as follow-up studies on these variables will be compiled and reviewed in this and future publications.

Secondary data sources (for example, *High School and Beyond*) will be analyzed relative to employment and educational outcomes for youth both with and without handicaps. As is the case with *High School and Beyond,* a series of analyses will be conducted for each of these outcome measures for students reporting each handicapping condition as well as by groups based on their graduation status from high school. Longitudinal analyses are performed with the respondents who were sophomores in 1980 and were followed up as part of the study in 1982, 1984, and 1986. Characteristics of youth with handicaps will be compared to those without handicaps. At present, data tapes are available which describe the partic-

ipation of the sophomore cohort in the *High School and Beyond* study through the spring of 1986.

The document, *Digest on Youth in Transition*, is organized to describe the available information on such variables as the incidence of handicapping conditions, employment and unemployment rates for youth both with and without handicaps, minority status among youth with handicaps, secondary school completion data, employment status, earnings, and quality of life measures.

Specific Secondary Data Sources Examined

The transition from youth to adulthood has become an increasingly important topic for researchers, policy analysts, and practitioners. This volume of the *Digest on Youth in Transition* examines in detail two U.S. Department of Education extant data sources. The first is the *Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act*. The second is the National Center for Education Statistics' *High School and Beyond* second follow-up longitudinal data files. Each of these data sources is unique in composition, though both were initiated to provide a wide range of data for examination by interested parties. The following sections provide a brief overview of the data files and their salient characteristics. Future editions of the *Digest* will examine proposed updates on these data sources following the primary theme of transition from school to work.

1. *Eighth Annual Report to Congress on the Implementation of Education of the Handicapped Act* examines the progress made in implementing the mandates of the Education of the Handicapped Act, as amended by P.L. 98-199. According to the U.S. Department of Education,

> the data presented in the report demonstrate that the States have successfully implemented the procedural features of the Act. However, those data also attest to the continuing need to strive for quality in all aspects of programming for handicapped children and their parents. (p. iii)

In addition to the basic data provided by the states, the report includes information from some of the discretionary programs. These program grants include support for research, development, evaluation, demonstration, personnel preparation, and technical assistance activities. Contained within the reports are descriptions of legislation and priorities set by OSERS. One of these priorities is a major initiative to improve the services available to adolescents with handicaps moving from education to the world of work.

The data examined in this *Digest* are taken directly from the state reports on the numbers of children 3-5, 6-11, 12-17, and 18-21 years old served under P.L. 94-142 by handicapping condition during the 1985-1986 school years (Tables 6A4 and 6A5, pp. 202-203). In future editions, OSERS intends to provide exiting information on the number of students with handicaps graduating from or dropping out of high school which we will discuss in a future publication.

2. *High School and Beyond* (HSB): The Second Follow-up of the 1980 Sophomores is a national study initiated for the National Center for Education Statistics(NCES) by the National Opinion Research Center at the University of Chicago. The data collection process began with the group administration of questionnaires and achievement tests to 30,000 sophomores and 28,000 seniors enrolled in more than 1,000 public and private schools in the spring of 1980. HSB continued with a second collection of data from the 1980 sophomores and seniors in spring 1982 and the collection of high school transcripts in fall 1982 for a subsample of the sophomore cohort members. A third data collection from 1980 sophomores and seniors took place in spring 1984. The final data collection for HSB took place in spring 1986.

The most recent data files analyzed in this report are from the 1984 second follow-up and contain both postsecondary education and job histories for the two years after high school graduation. In addition, these files contain information on school, family, work experience (during and after high school), educational and occupational aspirations, personal values, high school test scores, and credits earned in selected curricular areas. Information is also collected on students who are classified as dropouts, transfers, and early graduates.

The results from our analyses should contribute to a greater understanding of the development of young adults and of the factors that determine individual education and career outcomes. Such information is useful as a basis for review and reformulation of federal, state, and local policies affecting the transition of youth from school to adult life.

One of the more unique features of HSB is its "weighting" capabilities. Student weights are available for use in obtaining population estimates that reflect the total national frame rather than only the students from the cooperating schools. The sophomore cohort weights estimate the population of roughly 3,800,000 high school sophomores in 1980. The weights were developed to compensate for differential selection probabilities and participation rates across all survey waves (NCES, 1986).

In contrast to the P.L. 94-142 definitional guidelines, students in the sample were asked (in self-administered questionnaires) whether they had any of six specific handicappings, whether they had a condition that limited the kinds or amount of work or education they could do, and whether they participated in special programs for those with physical or educational handicaps. The following handicaps were considered:

- Specific Learning Disabilities
- Visual Impairments
- Hearing Impairments
- Deafness
- Speech Impairments
- Orthopedic Impairments
- Other Health Impairments

Additionally, there are three details concerning the sample for HSB that limit the definition of students with handicaps in the data. First, the student population for the survey was defined as students who were enrolled in high school programs leading to graduation and a diploma. This definition eliminated from the sample all students who were in nondegree

programs (leading, for example, to attendance certificates) and thereby eliminated one subset of students often included when defining handicaps. Second, although attempts were made to accommodate such problems, most students had to be able to read and fill out the questionnaire themselves. Thus, a second subset was also largely excluded. Third, because NCES was concerned that no students be made uncomfortable or unhappy by participating, any students drawn into the sample who were considered by teachers to be "at risk" were excluded, which may have eliminated some of the students with emotional or mental handicaps. In addition, the estimated 39,000 secondary school students in residential schools for exceptional students were not eligible for the sample. This is also true of those with multiple handicaps, mental retardation, and serious emotional disturbances who were enrolled full-time in special education programs not leading to a diploma. Thus, the nature of the sample is such that it is essentially composed of students with mild or borderline handicaps.

2

An Analysis of the Number of Youth with Handicaps Served by Conditions: Summary of State Level Cohort Analyses (Ages 3-5, 6-11, 12-17, and 18-21)

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The *Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act* contains a series of informational charts and figures relevant to policy analysts. The data, describing the number of children served under EHA-B by handicapping condition, are the primary source of information for this chapter, providing actual counts of youth served for each of the following four cohorts: 3-5, 6-11, 12-17, and 18-21 years of age. These data are reported annually by the States and serve as an excellent resource to evaluate the extent to which the Act is being implemented.

During the school year of 1984-1985, the States reported that 4,363,031 children with handicaps were counted as receiving special education and related services under EHA-B and

P.L. 89- 313, the Education Consolidation and Improvement Act. This figure represents a 0.5% increase in the total number of youth served over the previous years, and a cumulative increase of 17.6% since the first count taken in 1976-1977.

This chapter presents a descriptive analysis of the number of youth served by handicapping condition across all states for the four age cohorts. Graphical displays are used to focus attention on the range of percentages of youth served reported for each of the handicapping conditions. Of interest is the wide variability among states in the percentage of students served in each handicapping condition.

Cross-state instability in reported percentages of youth served with a particular handicapping condition can be attributed to several factors. First, differing environmental, sociocultural, geographic, and socioeconomic characteristics across states may influence the organization and nature of educational service delivery, resulting in different segments of the school age population considered at-risk and in need of special education services. Second, varying classification schemes and identification procedures chosen by states may result in different profiles of population served. Third, cross-state differences in the percentages of students served by handicapping condition may occur as a result of variations in the manner in which states collect and report data. Whatever the etiology, cross-state comparisons provide an excellent data source with which to estimate the consistency of special education service delivery across the country.

A second comparison to be considered is the percentages of handicapping conditions served across time, as represented by the four age cohorts. These analyses may be valid indicators of school systems' ability and commitment to move exceptional students back into regular education as quickly and fully as is feasible, given the students' educational needs. Analysis of age groups served may also be accurate indicators of states' implementation of federal legislation concerning special age groups, such as early childhood and transitioning youth.

Table 2.1. Percentage of Youth (Ages 3-5) Served When Summarized at the National Level (DC included). (N=51 States Reporting)

Handicapping Condition	Mean Percentage	Standard Deviation	Minimum	Maximum
Learning Disabilities	7.33	7.59	0.00	40.00
Speech Impairment	71.67	12.45	40.00	90.00
Mental Retardation	7.73	4.26	1.00	22.00
Emotional Disturbance	2.31	2.49	0.00	9.00
Hard of Hearing & Deafness	2.00	1.08	0.39	5.00
Multiple Handicaps	4.12	5.09	0.00	29.00
Orthopedic Impairments	2.69	2.04	0.00	11.00
Other Health Impairments	1.33	1.91	0.00	11.00
Visual Handicaps	0.63	0.63	0.00	3.00
Deaf-Blindness	0.02	0.14	0.00	1.00

Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Analysis by Age Cohort

Tables 2.1 to Table 2.4 summarize the percentages of youth presently being served by each of the handicapping conditions for the four age cohorts respectively. These analyses are based on the aggregation of data reported at the State level for all 50 states and the District of Columbia.

Age group 3-5. The results from Table 2.1 indicate that, on the average, 72% of the children with handicaps (3-5 years of age) served are in the speech impaired category as reported at the state level. The actual percentage reported ranges from as high as 90% in one state to as low as 40% in another. All other handicapping conditions remain at fairly low incidence with mental retardation (7.7%) and learning disabilities rising above 5% of the population served. The remaining categories (emotional disturbance, hard of hearing and deaf, multiple handicaps, orthopedic impairment, visual handicaps, deaf-blindness, and other health impairments) represented a total of less than 15% of the children served.

Table 2.2. Percentage of Youth (Ages 6-11) Served When Summarized at the National Level (DC included). (N=51 States Reporting)

Handicapping Condition	Mean Percentage	Standard Deviation	Minimum	Maximum
Learning Disabilities	39.12	9.55	21.00	62.00
Speech Impairment	40.80	9.97	20.00	66.00
Mental Retardation	9.80	5.47	2.00	25.00
Emotional Disturbance	6.22	5.06	1.00	27.00
Hard of Hearing & Deafness	1.08	0.39	0.00	2.00
Multiple Handicaps	0.94	0.88	0.00	3.00
Orthopedic Impairments	0.98	0.68	0.00	3.00
Other Health Impairments	0.78	1.24	0.00	7.00
Visual Handicaps	0.20	0.40	0.00	1.00
Deaf-Blindness	0.00	0.00	0.00	0.00

Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Age group 6-11. The composition of this traditional school age population is quite different from the previous cohort. The results from Table 2.2 indicate that nearly 40% of the children with handicaps (6-11 years of age) served are youth from two of the categories: speech impaired (40.8%) and learning disabled (39.1%). The three categories with greater than 1% of the youth with handicaps served include children with mental retardation (9.8%), children with emotional disturbance (6.2%), and children who are hard of hearing or deaf (1.1%). Each of the remaining categories (multiple handicaps, orthopedic impairments, visual handicaps, deaf-blindness and other health impairments) made up 1% or less of the children served. The decline in percentage of these categories does not indicate a decrease in the number of these children served, but an increase in the number of students with other handicapping conditions who are being served at this age level.

Age group 12-17. Table 2.3 shows that in secondary school years, on the average, nearly three out of five youth with handicaps are learning disabled (59.2%). Two categories that have greater than 10% of the youth with handicaps include mental retardation (18.2%) and emotional disturbance (11.1%). The remaining categories (hard of hearing & deafness, multiple

Table 2.3. Percentage of Youth (Ages 12-17) Served When Summarized at the National Level (DC included). (N = 51 States Reporting)

Handicapping Condition	Mean Percentage	Standard Deviation	Minimum	Maximum
Learning Disabilities	59.25	10.52	37.00	81.00
Speech Impairment	6.84	4.82	2.00	27.00
Mental Retardation	18.25	10.14	4.00	49.00
Emotional Disturbance	11.14	7.52	1.00	38.00
Hard of Hearing & Deafness	1.10	0.41	0.00	2.00
Multiple Handicaps	0.96	1.08	0.00	4.00
Orthopedic Impairments	0.90	0.61	0.00	3.00
Other Health Impairments	1.10	1.51	0.00	8.00
Visual Handicaps	0.31	0.47	0.00	1.00
Deaf-Blindness	0.00	0.00	0.00	0.00

Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

handicaps, orthopedic impairments, visual handicaps, deaf-blindness, and other health impairments) represent less than 4% of the cohort collectively.

Age group 18-21. Students who remain in public education past traditional graduation age tend to fall into three disability groupings: learning disabilities (43.1%); mental retarda-

Table 2.4. Percentage of Youth (Ages 18-21) Served When Summarized at the National Level (DC included). (N = 51 States Reporting)

Handicapping Condition	Mean Percentage	Standard Deviation	Minimum	Maximum
Learning Disabilities	43.14	10.63	19.00	71.00
Speech Impairment	2.00	1.61	0.00	9.00
Mental Retardation	37.47	11.68	16.00	64.00
Emotional Disturbance	8.57	7.47	0.00	37.00
Hard of Hearing & Deafness	1.75	1.04	0.00	5.00
Multiple Handicaps	3.20	4.24	0.00	20.00
Orthopedic Impairments	1.80	1.83	0.00	12.00
Other Health Impairments	1.67	3.35	0.00	23.00
Visual Handicaps	0.47	0.61	0.00	3.00
Deaf-Blindness	0.06	0.24	0.00	1.00

Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

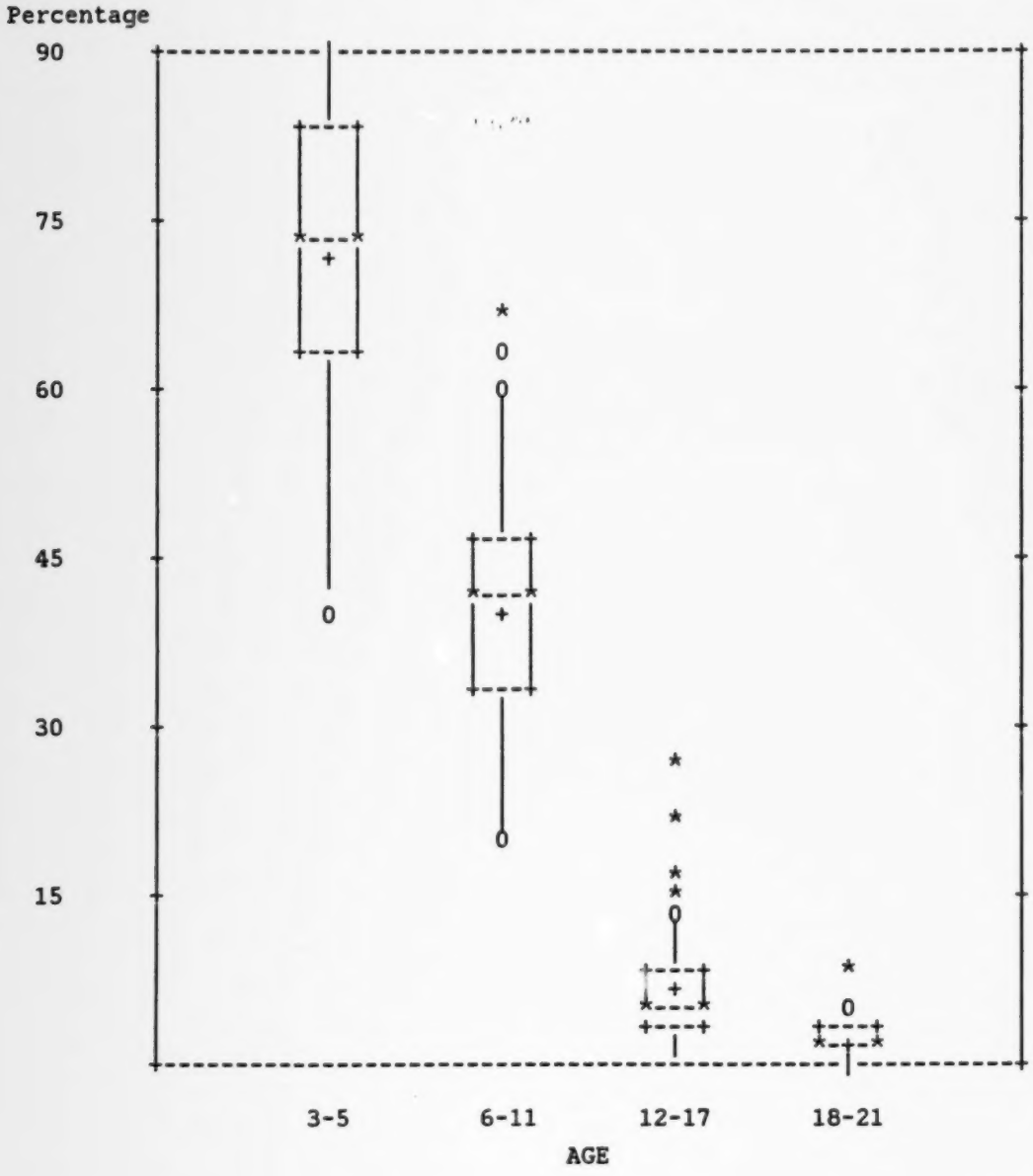
tion (37.5%); and emotional disturbance (8.6%). The remaining categorized conditions comprised less than 4% of the cohort and included: multiple handicaps (3.2%); speech impairments (2.0%); orthopedic impairments (1.8%); hard of hearing and deafness (1.8%); other health impairments (1.7%); visual handicaps (0.5%); and deaf- blindness (0.1%).

Trends Identified by Cross-age Analysis

Three categories which showed the greatest shift in youth served across age cohorts are speech impairment (Figure 2.1), learning disabilities (Figure 2.2), and mental retardation (Figure 2.3). In Figure 2.1, age cohort comparison shows a steady downward trend in the percentage of students with handicaps who are labelled "speech impaired." The trend may be noted by examining the difference in the distance between the "+" symbols in the boxes representing each of the four age cohorts. For example, between age groups 3 - 5 and 6 - 11, there is an average decline of 31 points. The trend continues until, in the 18 - 21 cohorts, on the average only 2% of the students served in special education are speech impaired.

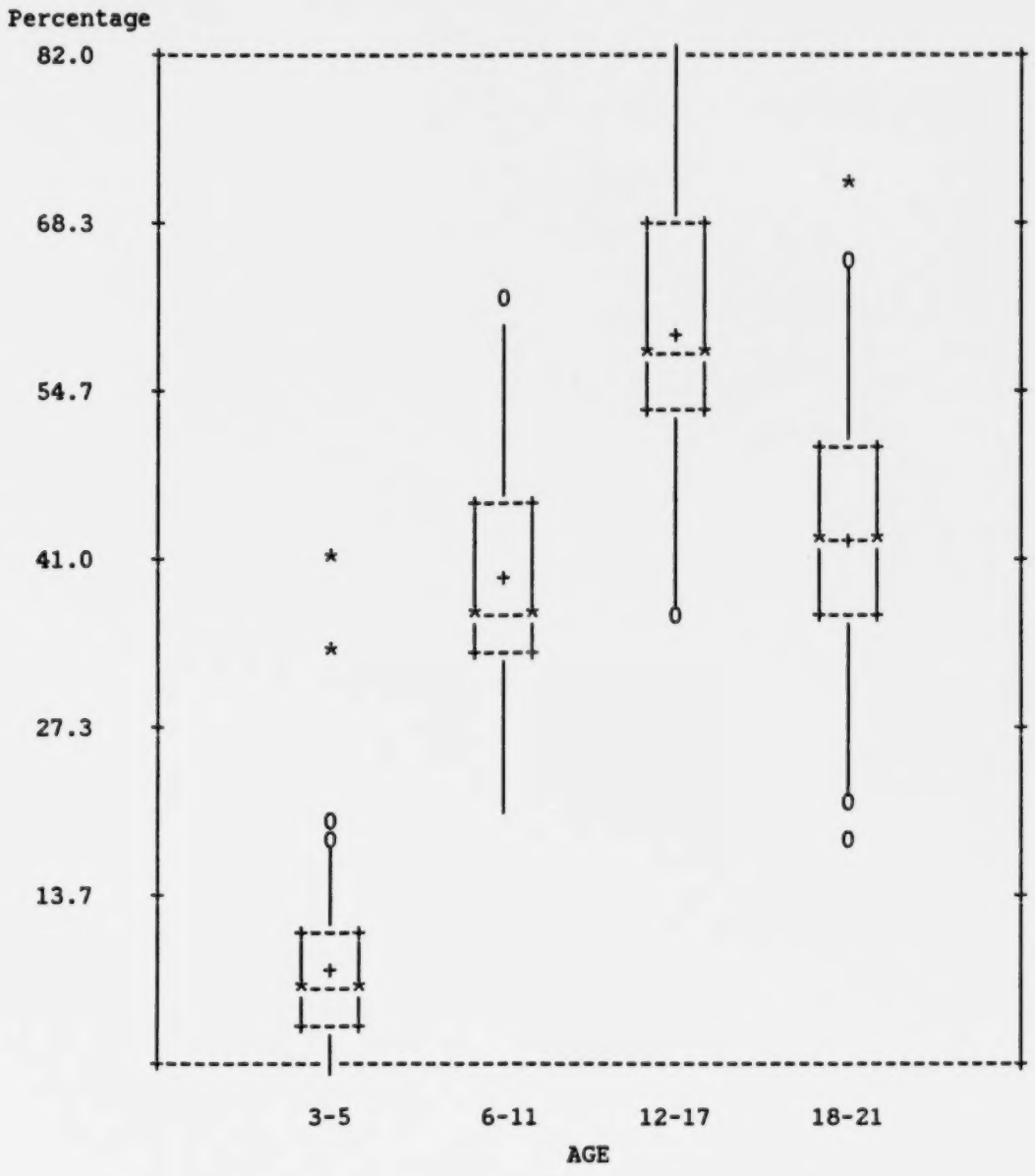
It is not surprising that, as we see in Figure 2.2, there is a large increase in the percentage of students who are identified as learning disabled as we move from the pre-school cohort (ages 3 - 5) to the school age cohort (ages 6 - 11). This upward trend continues throughout the secondary school years (ages 12 - 18) presumably as new students continue to be identified and previously identified students continue to require special education services. It is interesting to note that although there is a considerable drop in the percentage of students with learning disabilities between the third and fourth cohort, it appears that a significant proportion of students with learning disabilities continue to be served by public education after traditional graduation age. This trend may be a result of the growth of transition services throughout the country and the emphasis of public school involvement in the adult adjustment of special education students.

Figure 2.1. Box Plots for Percentage of Youth with Speech Impediments by Cohorts



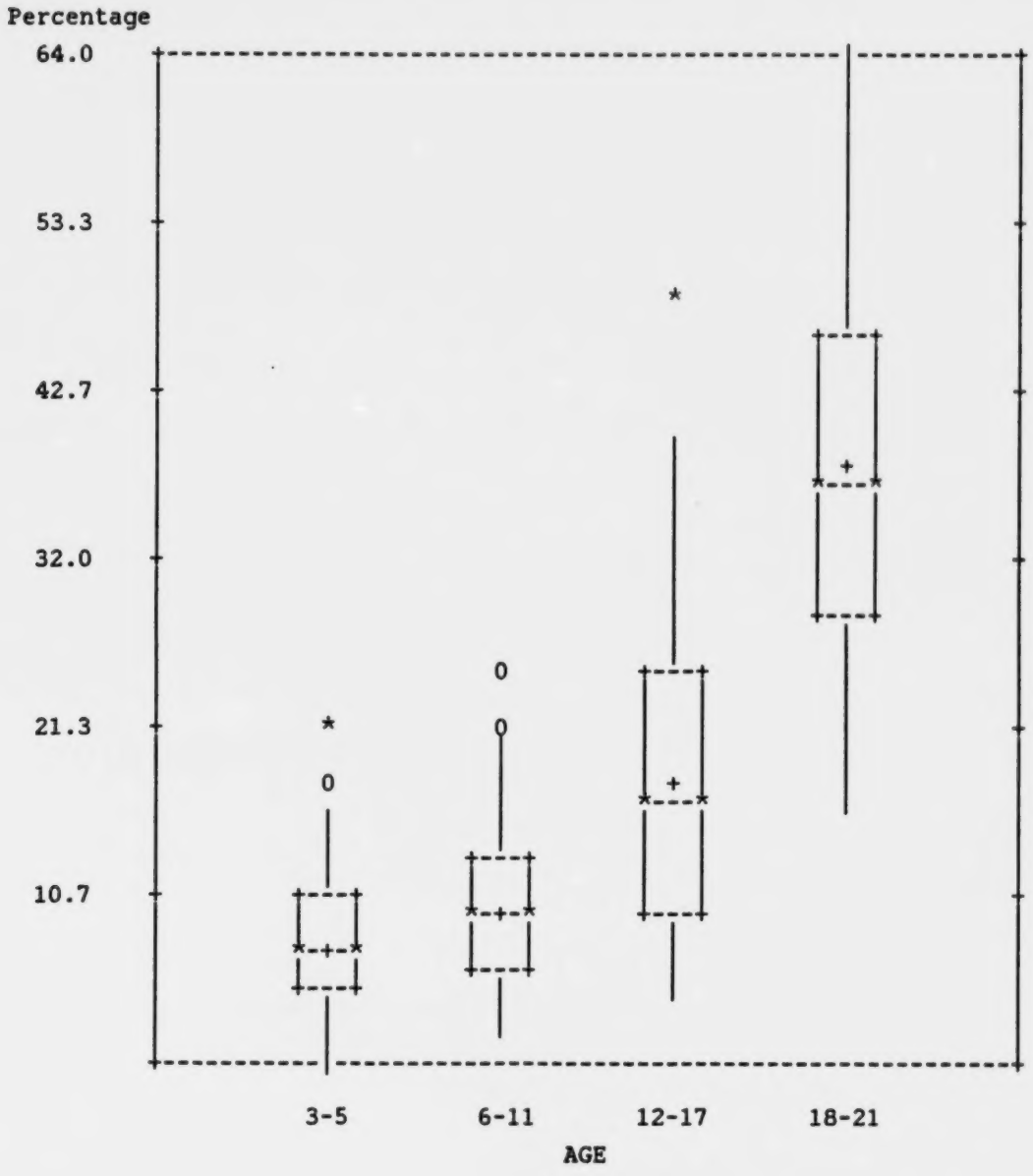
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.2. Box Plots for Percentage of Youth with Learning Disabilities by Cohorts



Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.3. Box Plots for Percentage of Youth with Mental Retardation by Cohorts



Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

The percentage of students with mental retardation steadily increases across age cohorts (Figure 2.3). The increase becomes most apparent in the secondary school years when those children in categories that predominated in the preschool and elementary years (such as speech impaired) no longer require services, and students with chronic impairments come to constitute a large percentage of students served. Another large increase occurs between the second and third cohort when large numbers of students with milder handicaps graduate or leave school, and students with mental retardation remain until they reach maximum age limits, making up a larger percentage of the population served.

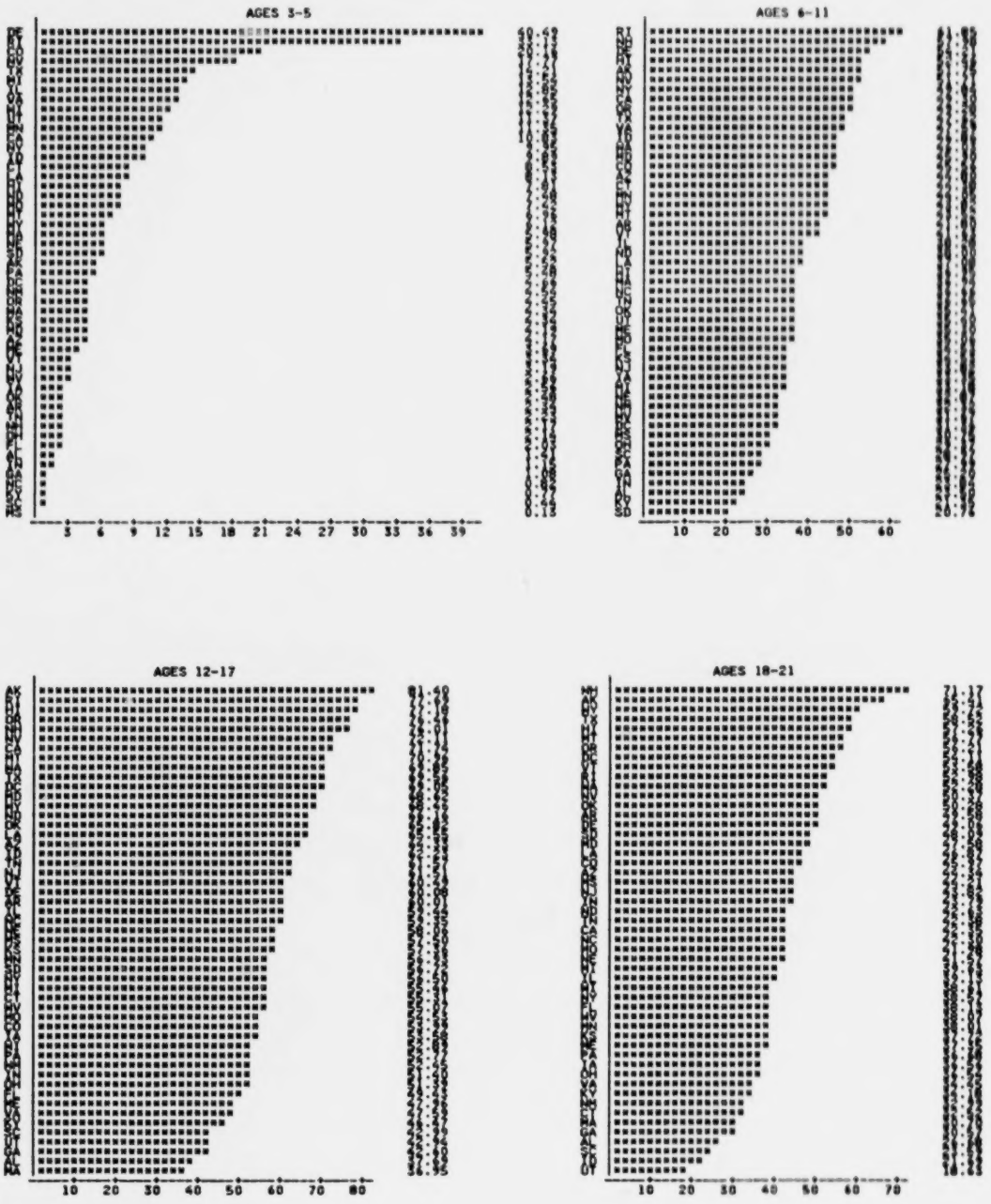
Recent legislation may alter these patterns in the next few years. Increased requirements for the provision of early childhood services may result in a larger and more diversified group of students receiving services in the age 3-5 cohort. These programs may result in the movement of students from special education roles back into the mainstream or in fewer students being classified at all. Thirteenth year and transition programs are becoming widely available to students in all handicapping conditions. Analyses such as those presented here may be important indicators of the impact of such legislation upon service delivery.

State Level Analysis of Youth Served

The next section of this chapter focuses on the percentage of youth served by state for each of the cohorts. Because the data are reported at the State level, the following displays are done at the level at which the data were gathered to examine the trends in the percentage of youth served by handicapping conditions.

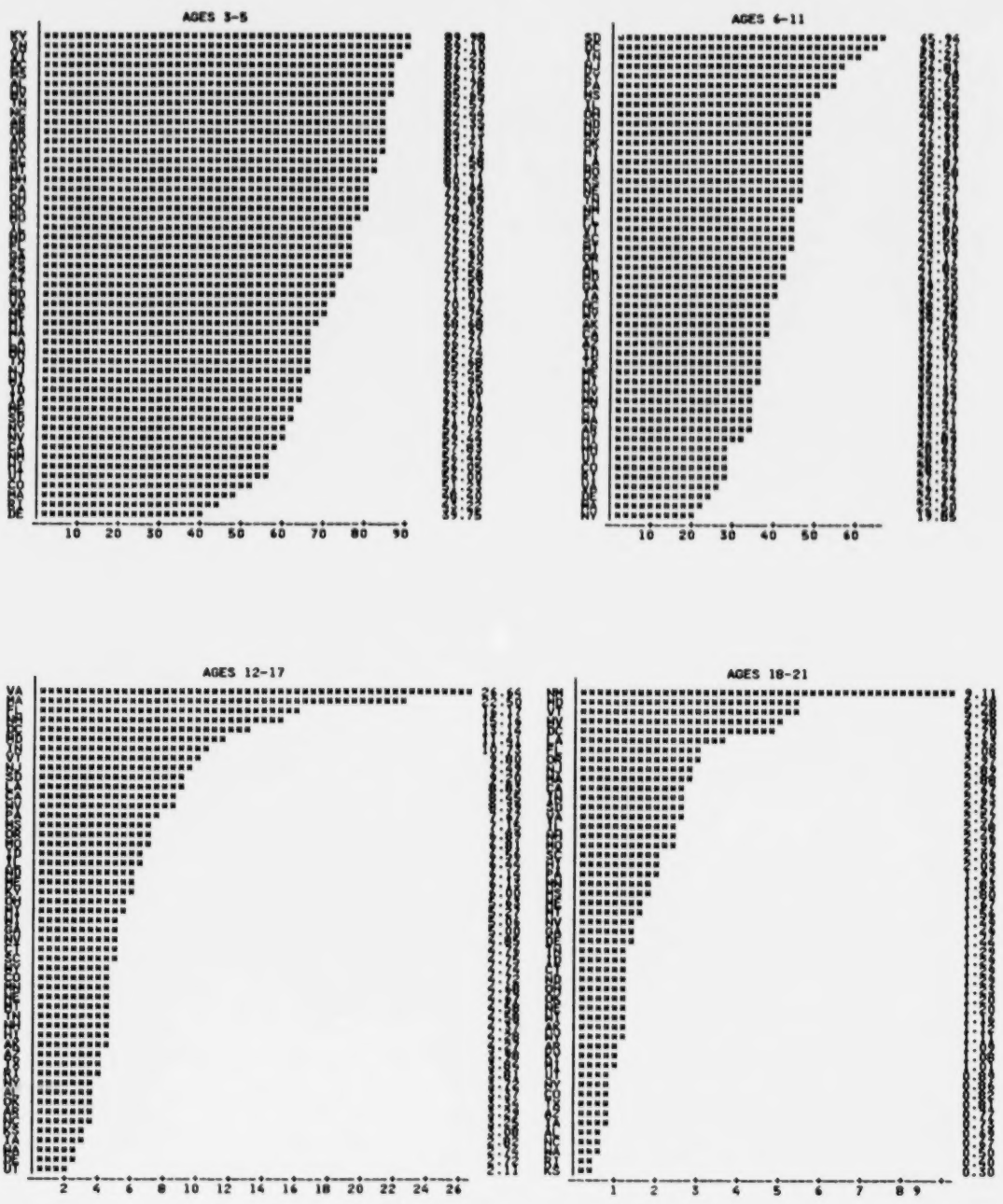
The next series of figures (2.4-2.13) illustrate in a horizontal bar graph format the descending order the percentage of youth served by handicapping condition and age cohort for each state and the District of Columbia. These displays allow the reader to identify similarities and differences across states, handicapping conditions, and age groups. For those states where the percentage of youth served differ greatly from the percentages reported by most

Figure 2.4. Percentage of Youth with Learning Disabilities Served by State Education Agencies



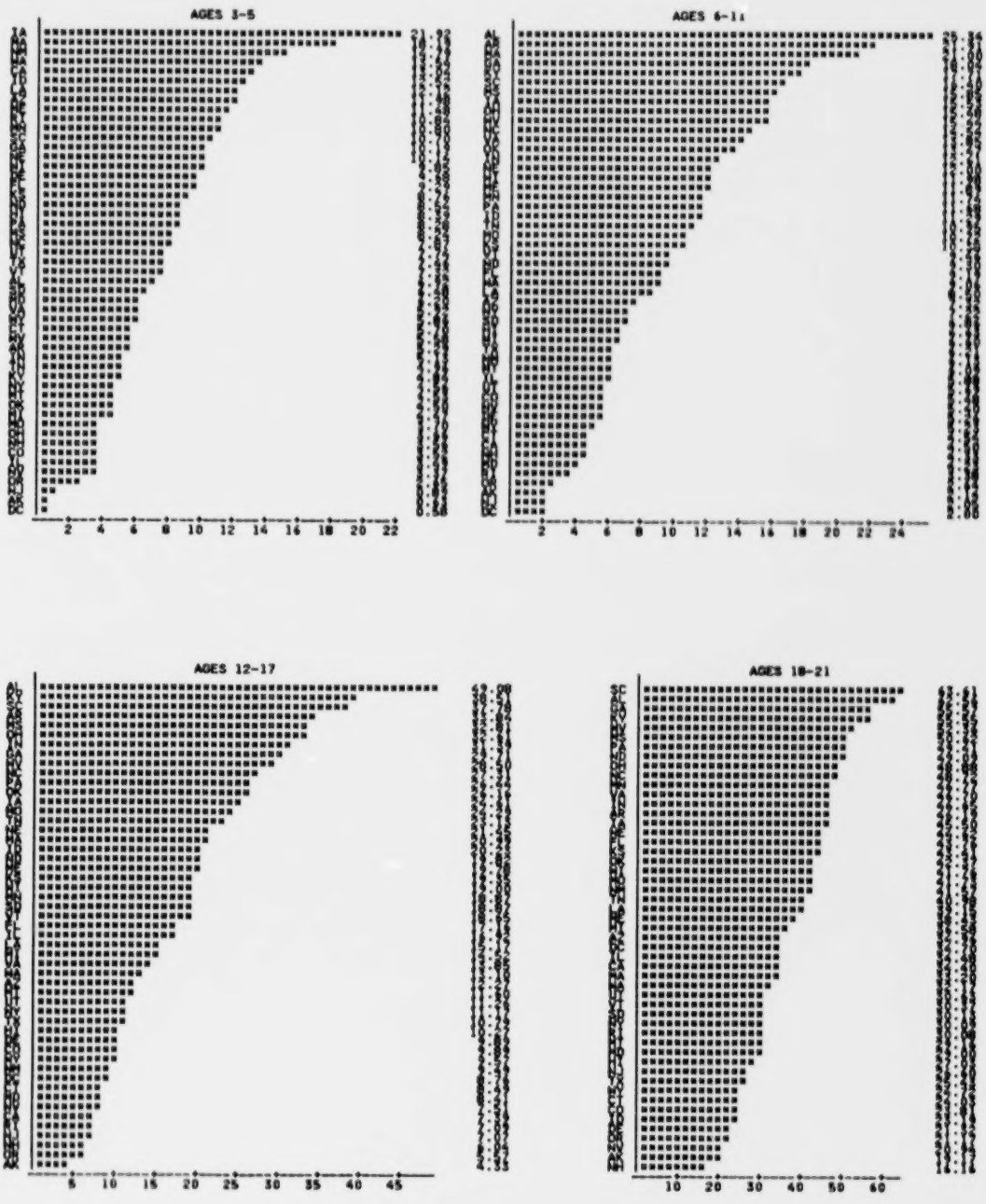
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.5. Percentage of Youth with Speech/Language Impairments Served by State Education Agencies



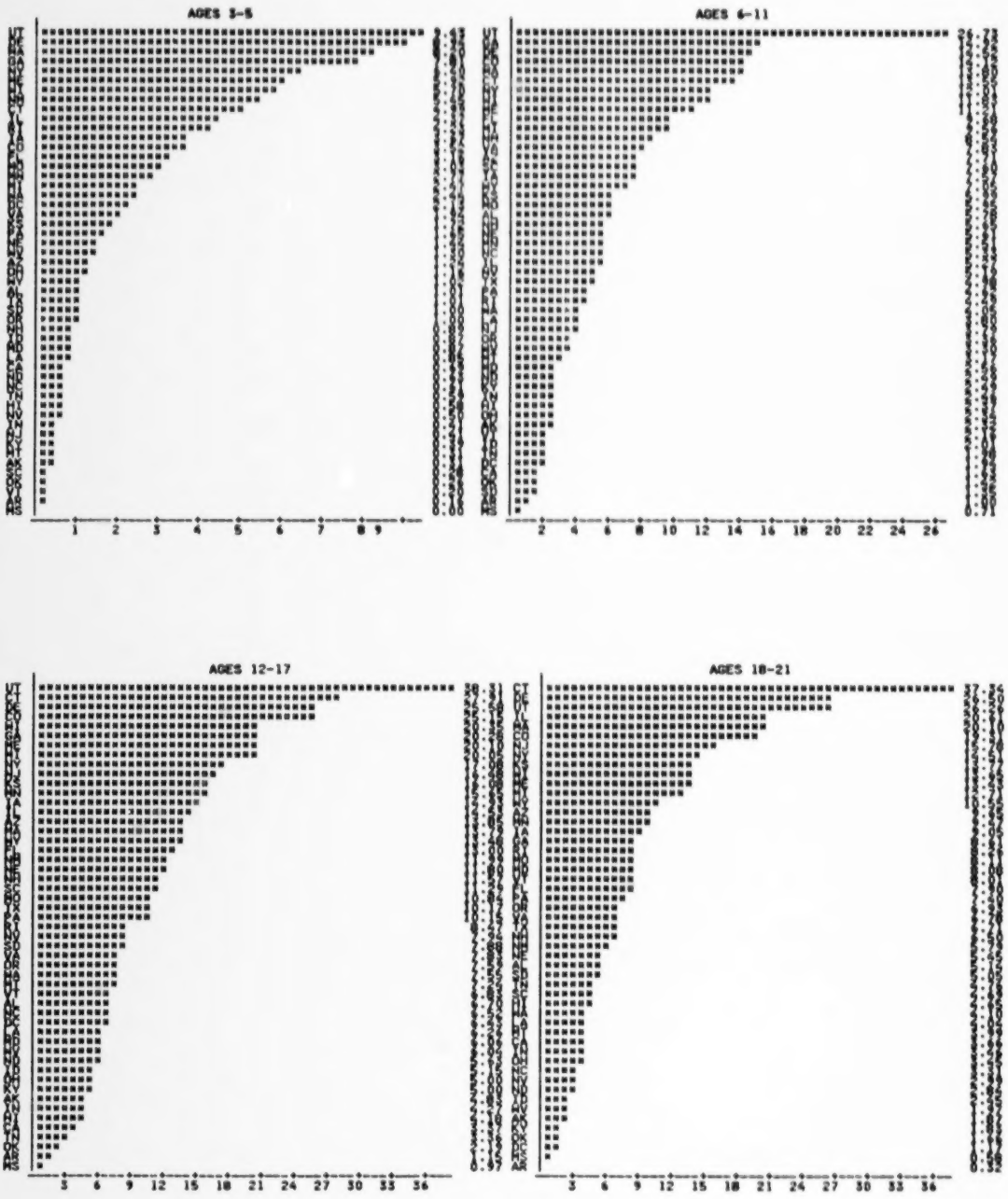
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.6. Percentage of Youth with Mental Retardation Served by State Education Agencies



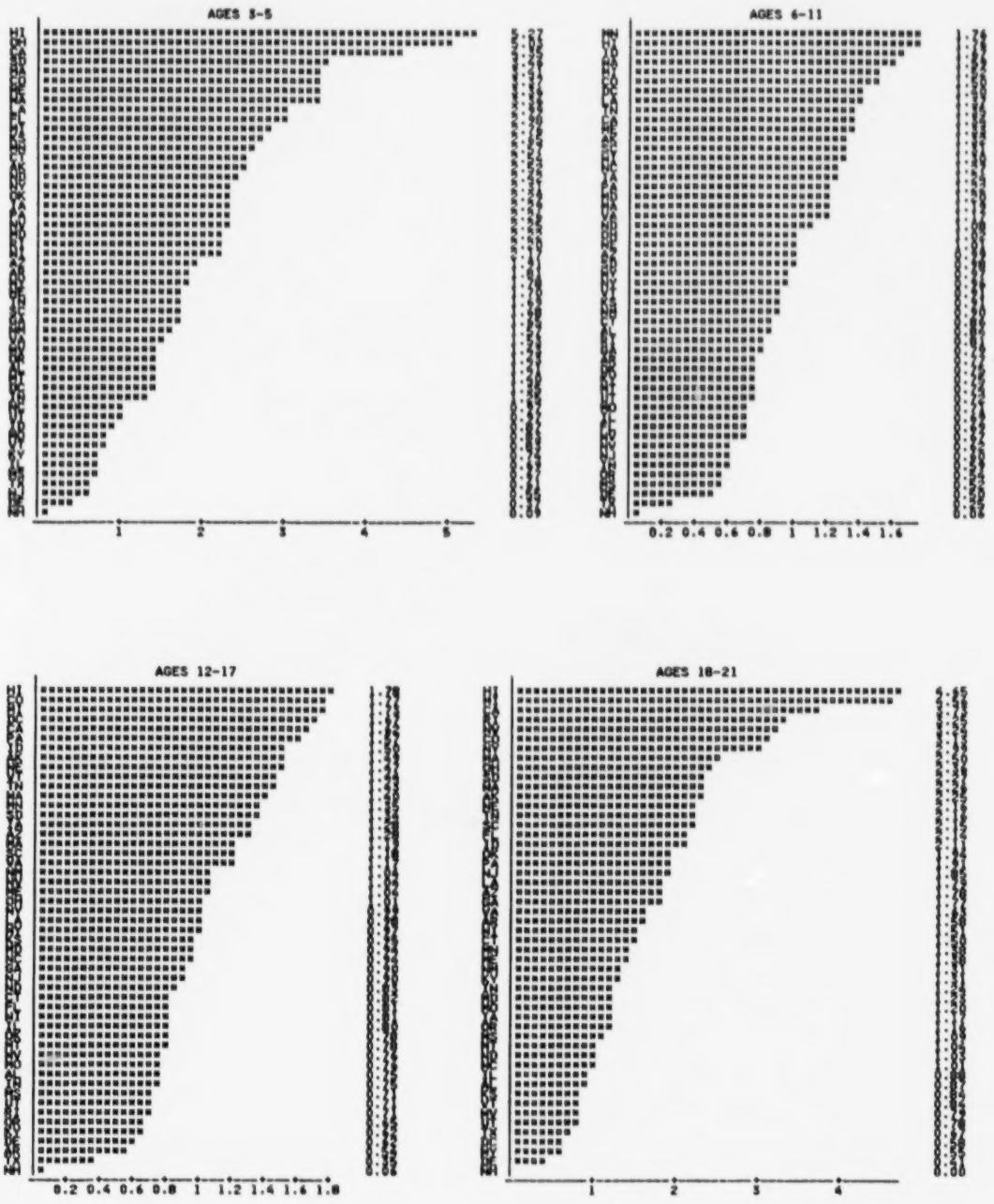
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.7. Percentage of Youth with Emotional Disturbance Served by State Education Agencies



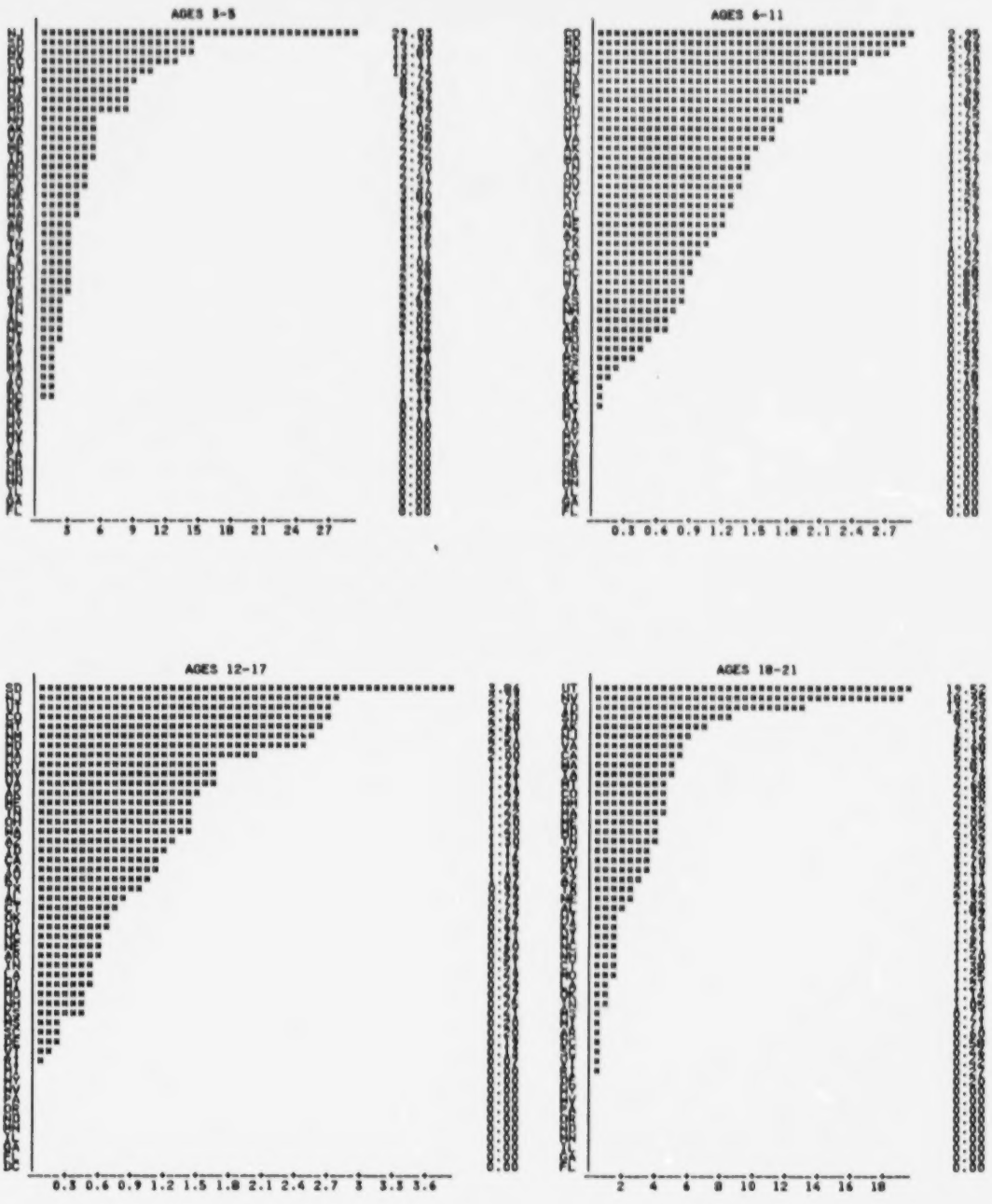
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.8. Percentage of Youth with Hearing Impairments Served by State Education Agencies



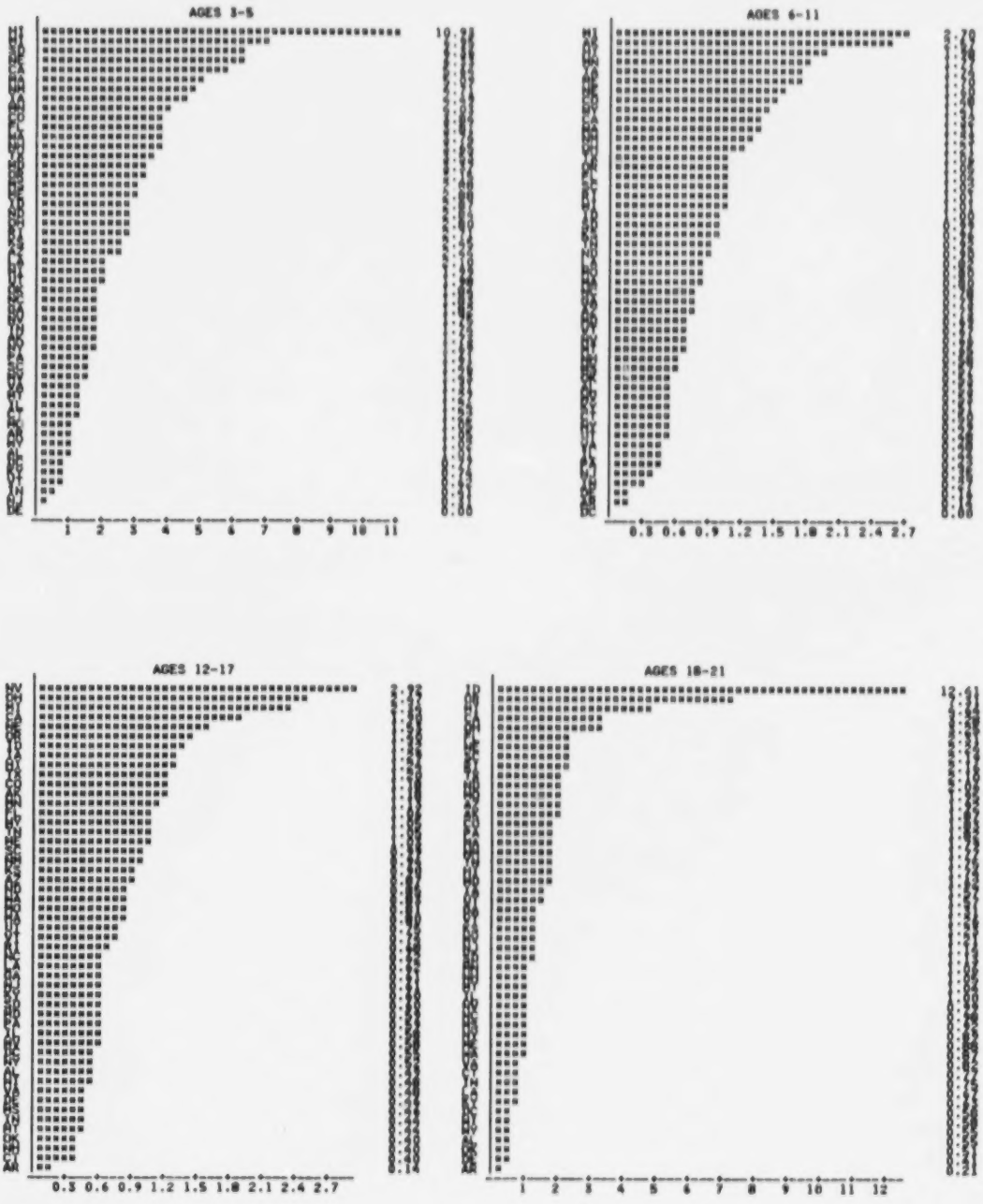
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.9. Percentage of Youth with Multiple Handicaps Served by State Education Agencies



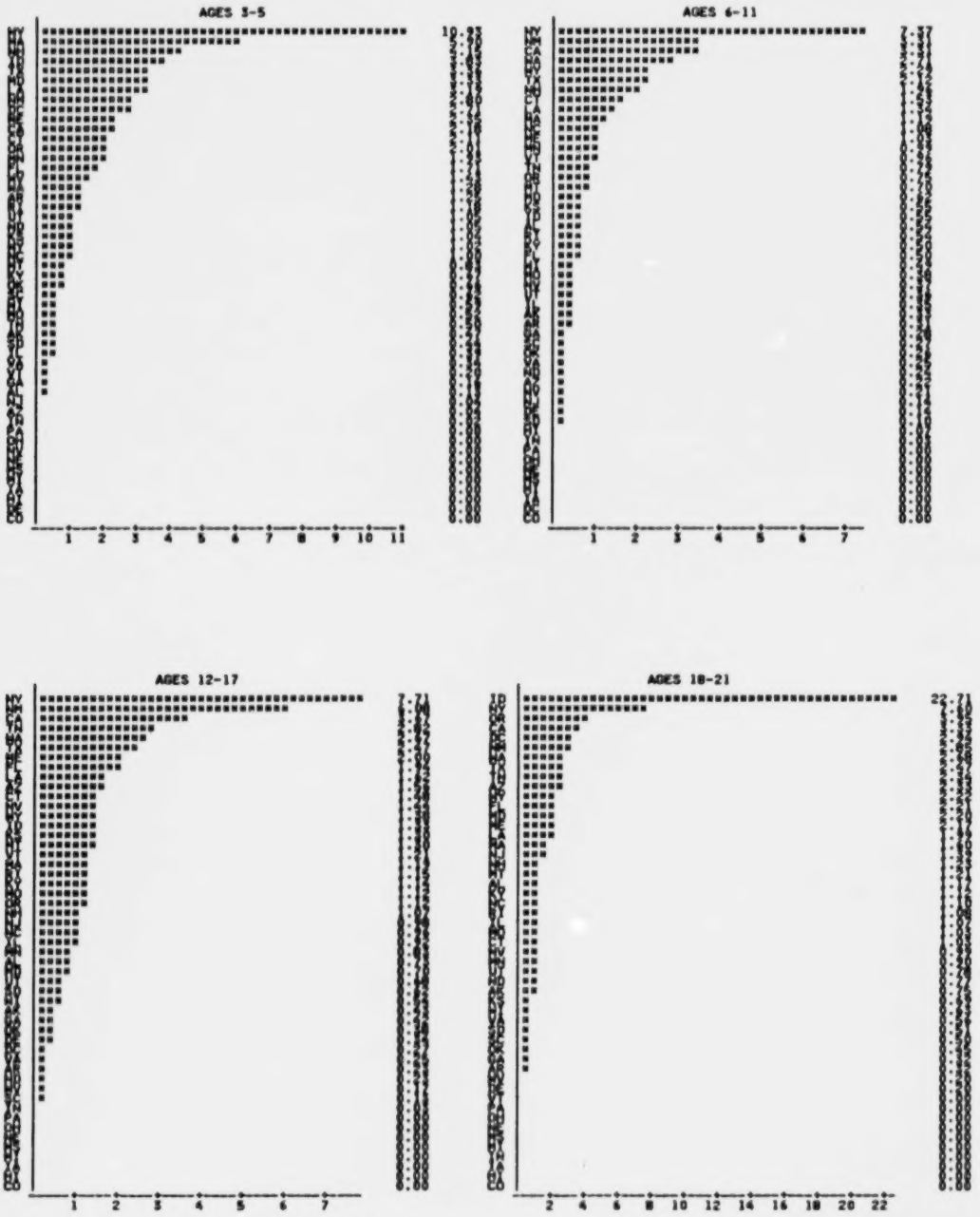
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.10. Percentage of Youth with Orthopedical Impairments Served by State Education Agencies



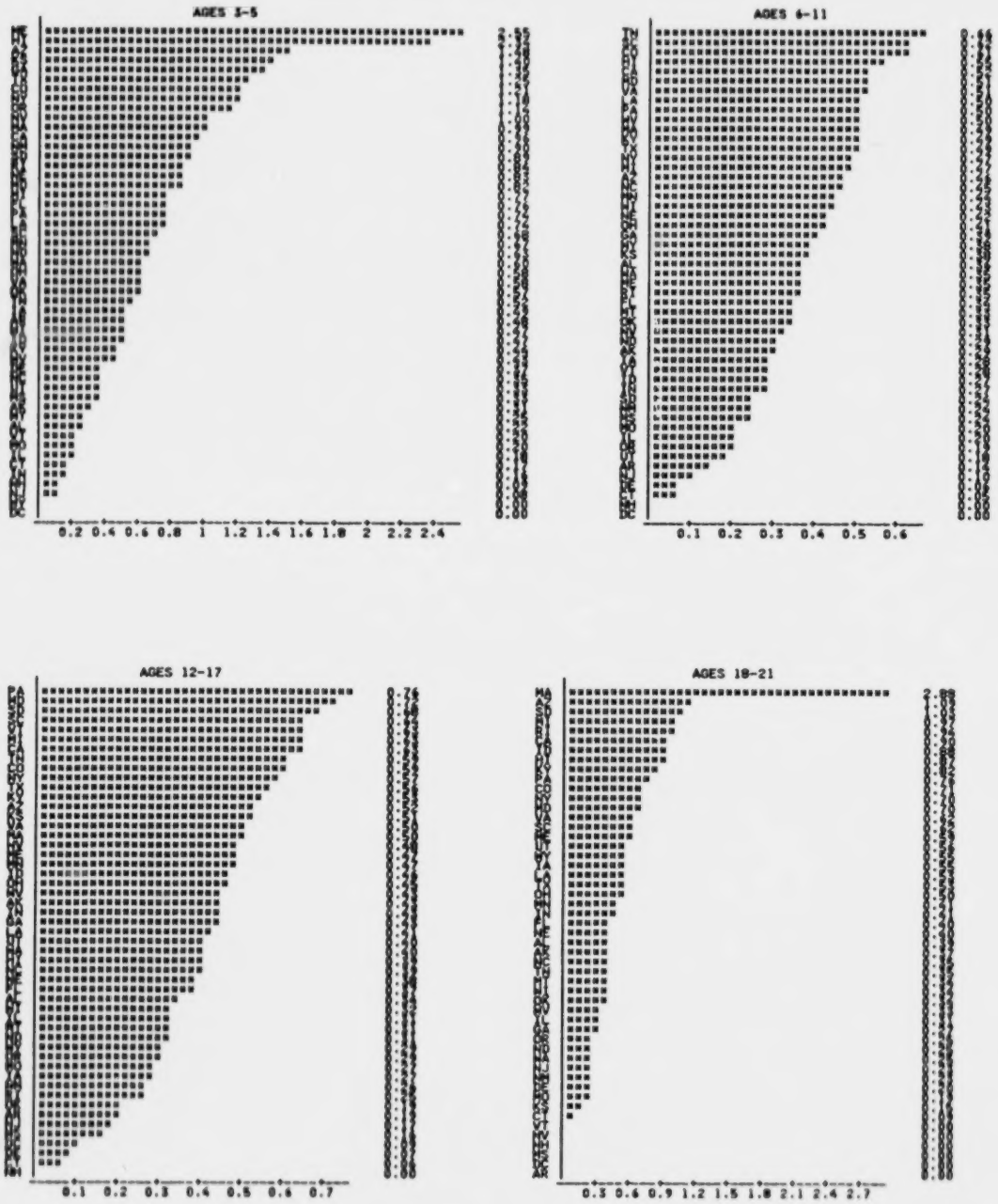
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.11. Percentage of Youth with Other Health Impairments Served by State Education Agencies



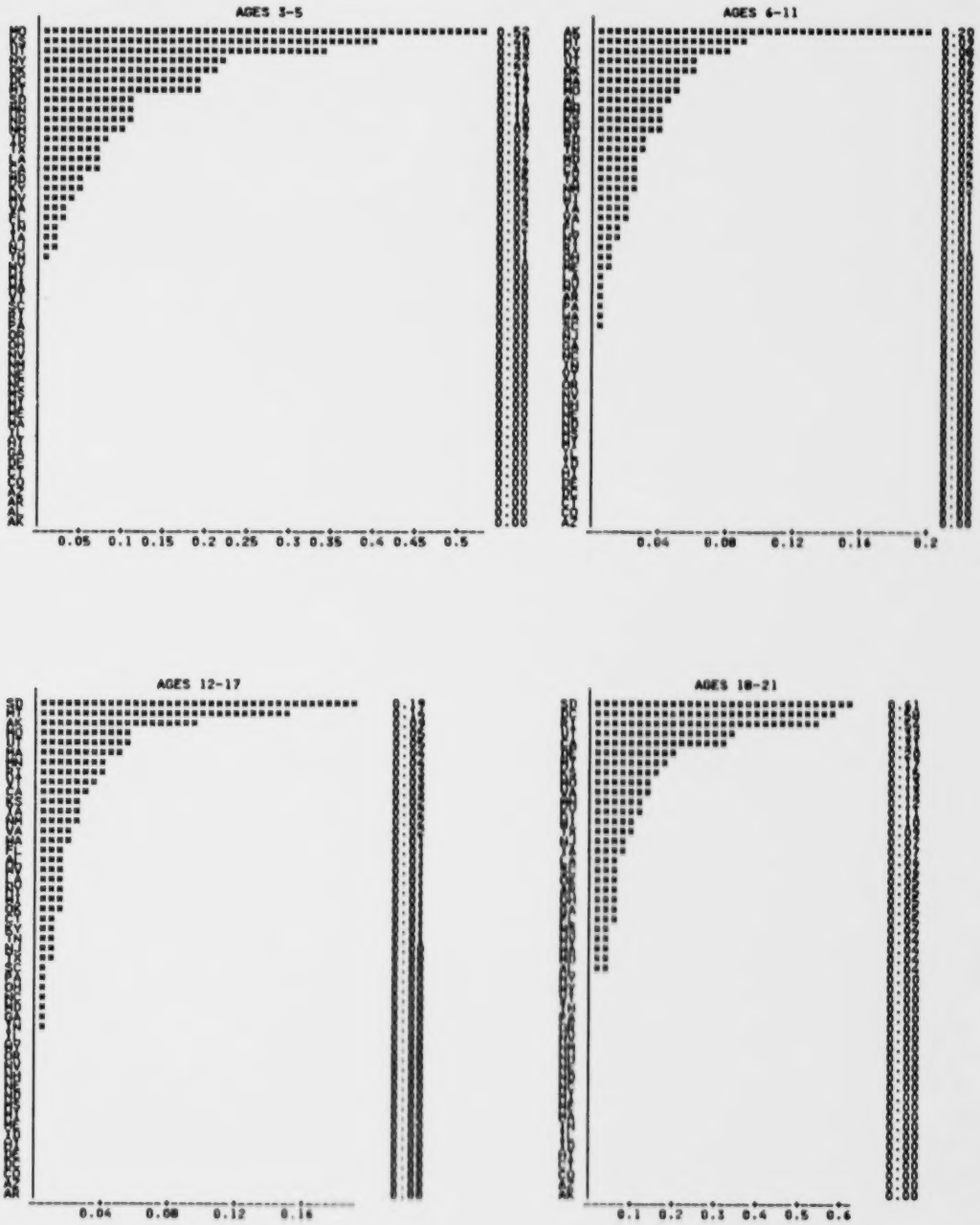
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.12. Percentage of Youth with Visual Handicaps Served by State Education Agencies



Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.13. Percentage of Youth with Deaf-Blindness Served by State Education Agencies



Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

other states, it may be necessary to examine policy and practice to determine the cause of the discrepancy.

Learning Disabilities. Figure 2.4 displays state level data on the percentage of students with learning disabilities in the population served by state special education agencies. The percentage varies across states for all age cohorts; in fact, this handicapping condition shows the widest fluctuation of scores reported of all the handicapping conditions included in this database. Given the definitional problems surrounding the field of learning disabilities and the varying schools of thought regarding diagnosis and subsequent intervention, this finding should not be surprising. In some states, rigid IQ cut-off scores and formulas comparing the discrepancy between academic achievement and general ability are used to identify students with learning disabilities. Other states rely largely on teacher referral and multidisciplinary team recommendations. These differences may greatly impact upon the number and type of students served in these programs and may account for much of the variation seen here.

An unusual pattern can be seen in the age 3 - 5 cohort. Over 75% of the states report less than 10% of students with learning disabilities in the population of students served, whereas 12 states report percentages of 10 or greater with two states reporting more than 30% of students served in this age group as having learning disabilities. This discrepancy may have a simple explanation. Many states have adopted formulas to compare the discrepancy between general ability and academic achievement. Often these formulas make it difficult to document significant deficits in academic achievement until the child is in the second or third grade. This situation precludes the identification of large numbers of students with learning disabilities in the age 3 - 5 cohort. Those states identifying relatively large numbers of students with learning disabilities at an early age may be relying on other diagnostic criteria.

It can also be observed that the percentage of special education students with learning disabilities continues to increase from elementary through secondary age cohorts in virtually all states reporting, which may indicate that students with learning disabilities tend to remain

in special education. They do not reach the point at which they are no longer in need of special services and can return to regular education, thus reducing the proportion served or at least holding it constant across elementary and secondary cohorts.

Finally, although the percentage of students with learning disabilities in special education decreases in the age 18 - 21 cohort, indicating that some students graduate or leave school, this handicapping condition still comprises over 40% of students in special education in 29 states. Those states reporting a low percentage of students with learning disabilities in this age cohort may be those with few transitional services for students with learning disabilities or those with high dropout rates.

Speech Impairments. Figure 2.5 presents the percentage of students with speech impairments served in special education across age cohorts for all states. The greatest range is seen in the pre-school cohort (Kentucky has the highest percentage (89.9%) of students enrolled in special education classified as speech impaired; Delaware has the lowest with 39.7%). Although a few states maintain percentages of 20 or greater during secondary school (Virginia, 26.6%; Florida, 22.5%), there is a general decrease in the percentage of students with speech impairments. At the postsecondary (age 18 - 21) level, students with speech impairments constituted less than 10% of those reported by all states.

Mental Retardation. The percentages of students with mental retardation vary considerably from state to state and across age cohort (Figure 2.6). The data do not provide evidence of much early childhood activity in the area of students with mental retardation. All but nine states reported 10% or less enrollment of students with mental retardation in the 3 - 5 year cohort. The percentage of students with mental retardation in the special education population increases throughout elementary and secondary years and the variation in percentage reported by state becomes even greater. In the 12 - 17 cohort, Alabama reports that 49% of its special education population is classified as mentally retarded, whereas Arkansas reports only 4.3%. Analysis of the identification procedures of each state as well as socioeconomic and other related conditions are necessary to explain the large discrepancies.

In general, states with a high incidence of poverty and a large minority population report a higher proportion of students with mental retardation. As seen in other displays, as students with other handicapping conditions graduate from or leave school, students with mental retardation come to represent a larger proportion of students served by special education in the age 18 - 21 cohort.

Emotional Disturbance. The percentage of students with emotional disturbance at the 3 - 5 age level is low (range = 9.4% to 0) for all states (Figure 2.7). In the elementary cohort, all but one state, Utah, report percentages of less than 15% (Utah: 26.7%). Although the percentages continue to increase in the secondary cohort, approximately 80% of the states report percentages at or below 15%. In the secondary cohort, Utah (38.3%) continues to lead in the percentage of special education students classified as emotionally disturbed, followed by Connecticut (27.9%) and Delaware (25.5%). These same three states report the highest percentages in the postsecondary cohort, far above the average of 8.6% for all states.

All Other Handicapping Conditions. The remainder of the handicapping conditions for which data were reported include hearing impairments (Figure 2.8), multiple handicaps (Figure 2.9), orthopedic impairments (Figure 2.10), other health impairments (Figure 2.11), visual handicaps (Figure 2.12), and deaf-blindness (Figure 2.13). These sensory and physical impairment categories show great similarity in the percentages reported and in differences across age cohort and will be discussed collectively. Affecting less than 10% of the overall population in special education, these conditions are generally identified early and persist throughout school years and adult life. The early identification and chronicity of these conditions result in children with these conditions routinely entering preschool programs. Because of the adaptive equipment, specialized instruction and educational materials, and transportation needs of these individuals, they are also likely to remain in public education until age 21. For this reason, they are represented in the highest percentage in the age 3 - 5 and 18 - 21 cohorts. During the elementary and secondary years, their numbers are overshadowed by the more prevalent disabilities such as learning disabilities and mental retardation. In some states the percentages of students with these conditions are not reported, either because the

incidence is so low or because some agency other than education maintains primary responsibility for this group.

The next section illustrates in a graphic form the percentage of youth served at each of the four age cohorts for each state where the states are alphabetized and in a fixed order.

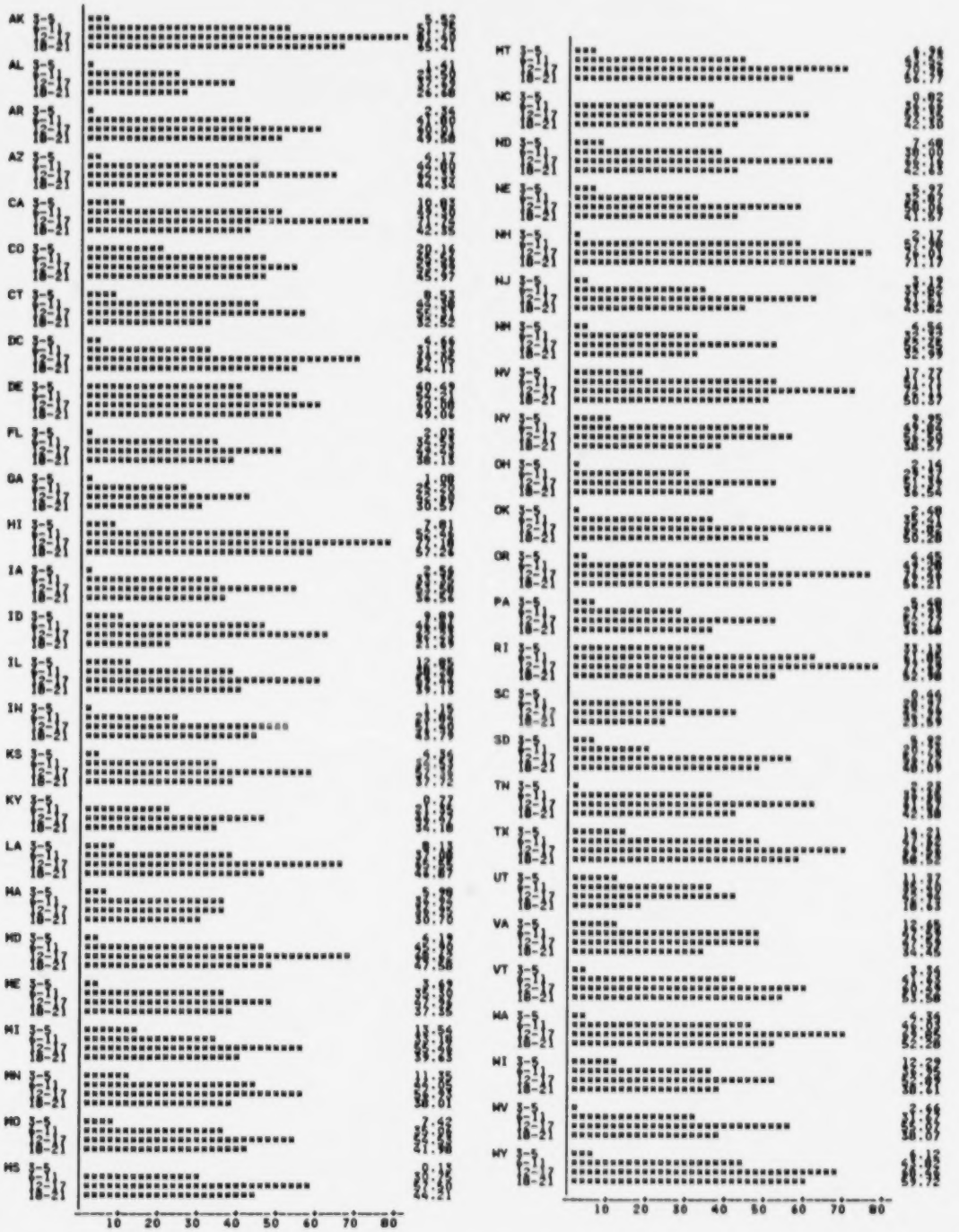
Figures 2.14 through 2.23 illustrate through the use of horizontal histograms the percentage of youth served by each of the 11 handicapping conditions at each of the four age cohorts for each state; the states are listed alphabetically and in a fixed order. This analysis makes it possible to examine the pattern of service delivery across age cohort for a particular state and handicapping condition. These cross-age comparisons are useful in assessing the extent to which state-level policy has carried out federal legislation in three areas: early childhood, transition, and, to some extent, least restrictive environment.

P.L. 98-199 and P.L. 99-457 extend the responsibility of public education beyond the traditional school years. These laws mandate programs from birth to three and three to five for special needs of infants and preschoolers. The intent of these programs is to enable children to acquire the skills necessary to transition to regular education. The legislation also mandates services for students of secondary and postsecondary school age, enabling them to make a successful transition to adult life. The effect of these initiatives should be seen in the participation of students of all handicapping conditions in preschool and transition programs. At present, no data are reported on the birth - 3 age group, but the age 3 - 5 cohort and the 18 - 21 cohort should have representation of all handicapping conditions in percentage commensurate with that of a school-age cohort.

In terms of least restrictive environment and the effectiveness of special education, for some handicapped groups, it may be expected that after a time in special education, some students might be brought to a level of proficiency that would enable them to leave special education and return to regular education. This phenomenon is apparent in the case of students with speech impairments and may also be possible for some other groups, for whom

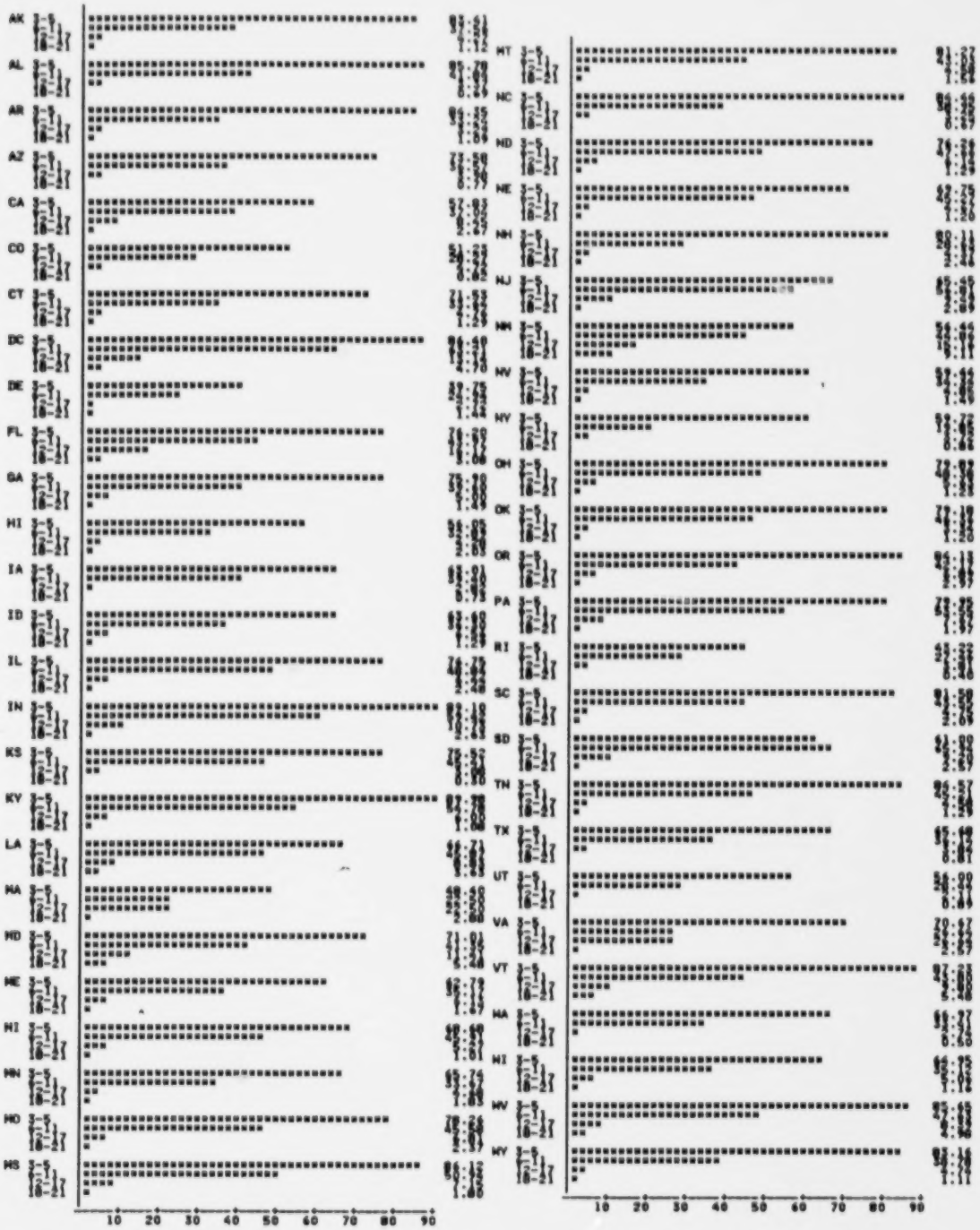
adaptive equipment or remediation may adequately compensate for the disability. It should be remembered that decreasing numbers of students in certain special education categories might also be attributed to negative circumstances such as dropping out. The profile of a particular state should be interpreted in the context of current and past state policy and the economic, social, and political status of the state.

Figure 2.14. Percentage of Youth Served with Learning Disabilities at Four Cohorts



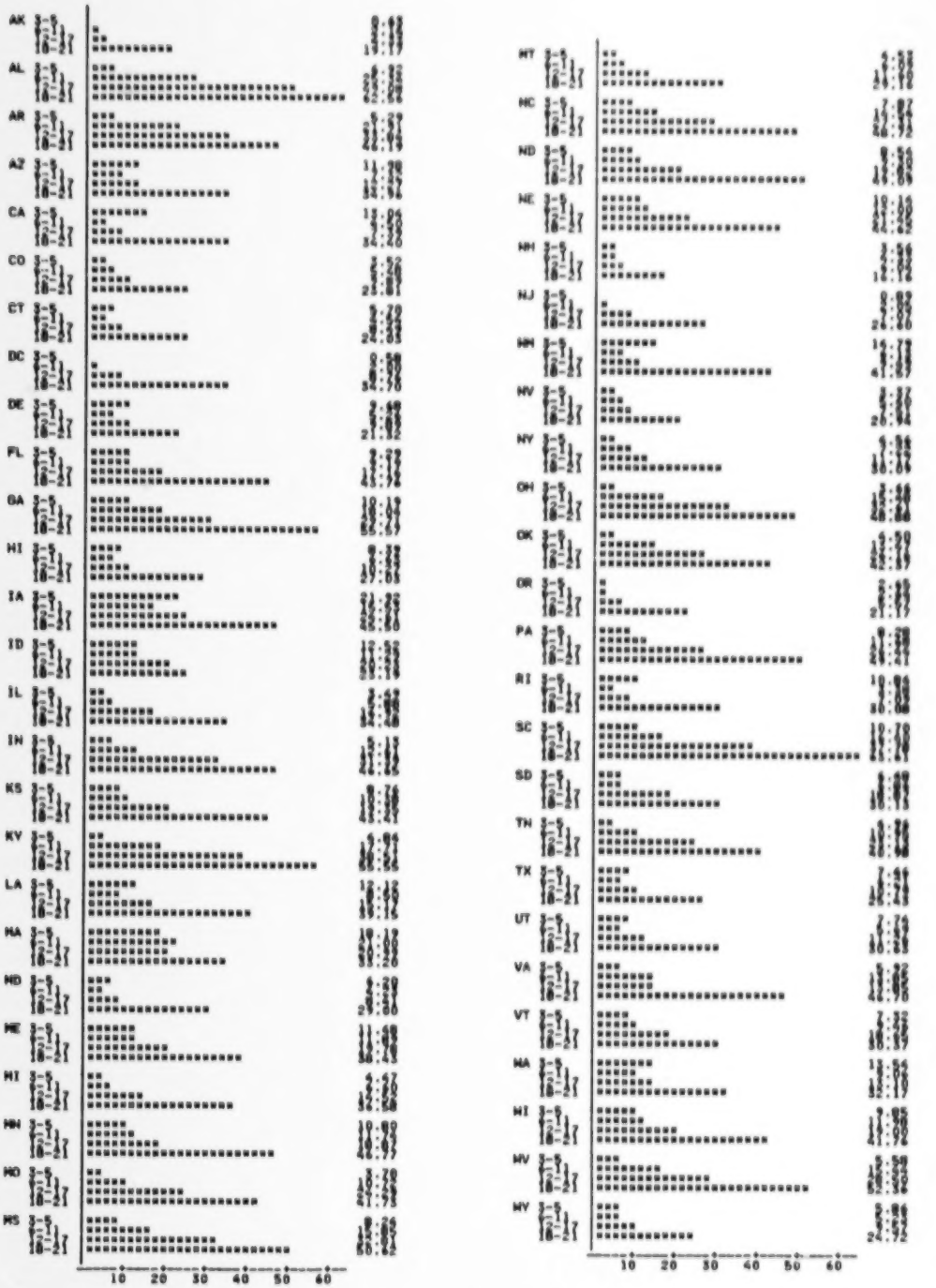
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.15. Percentage of Youth Served with Speech/Language Impairments at Four Cohorts



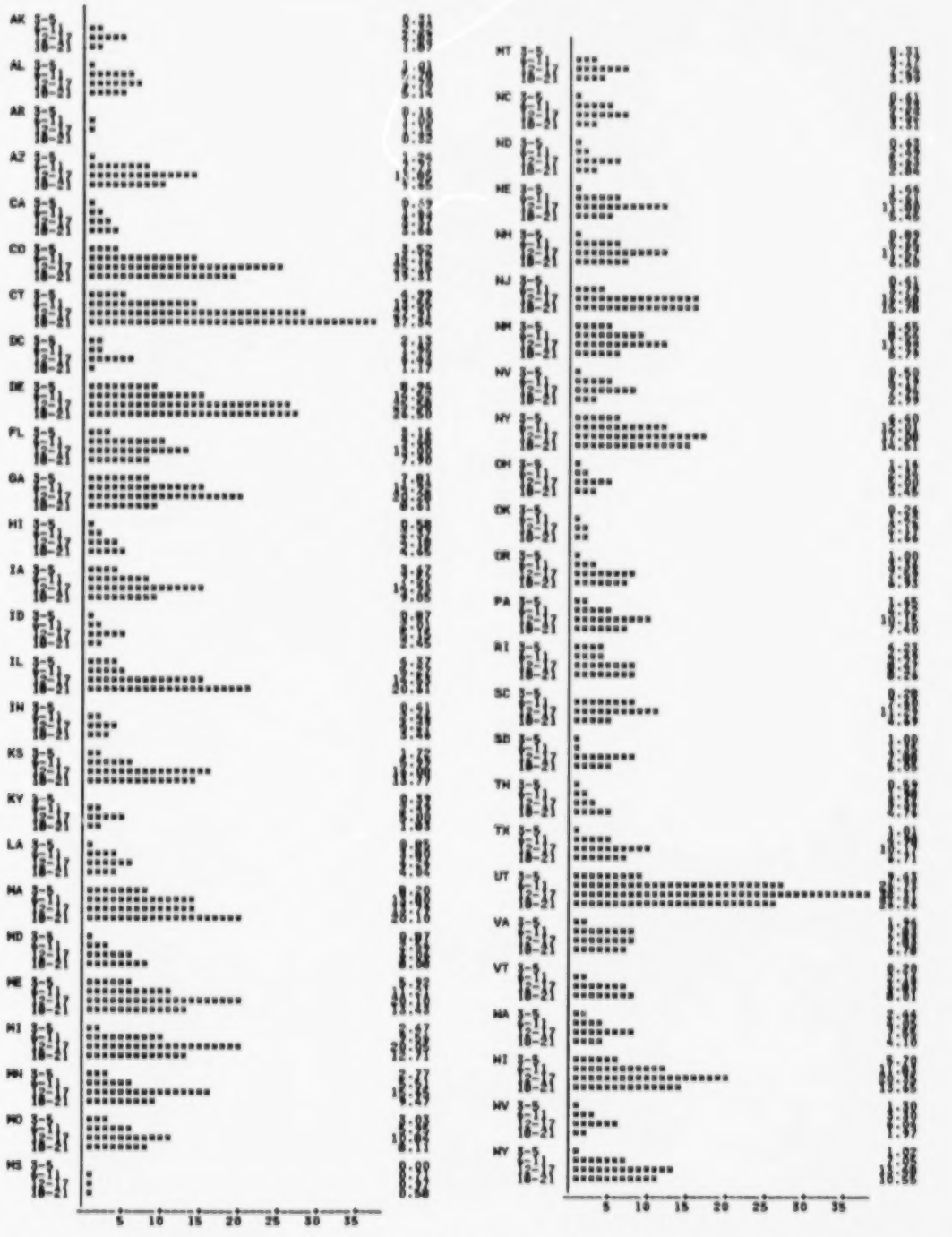
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.16. Percentage of Youth Served with Mental Retardation at Four Cohorts



Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.17. Percentage of Youth Served with Emotional Disturbance at Four Cohorts

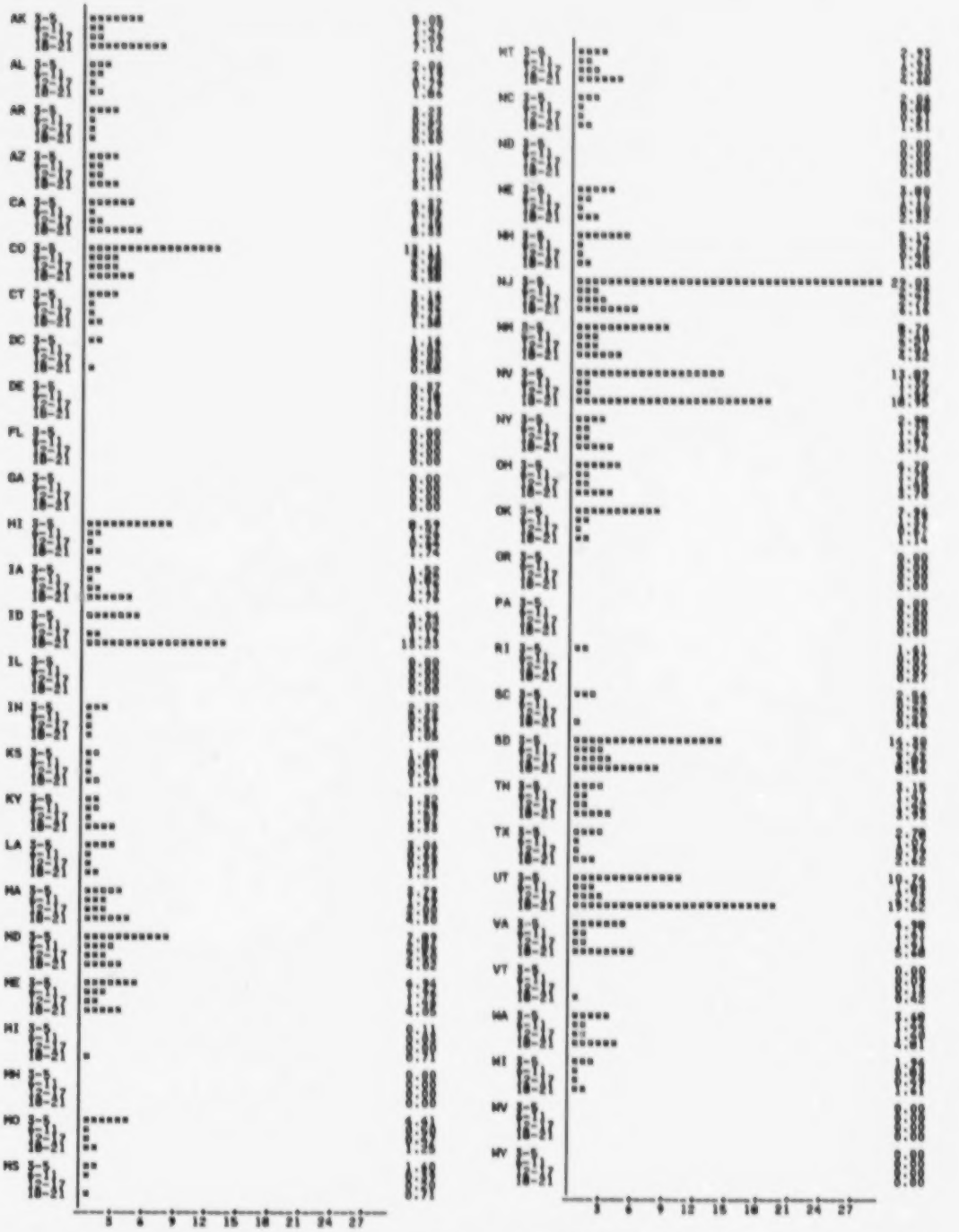


Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.18. Percentage of Youth Served with Hearing Impairments at Four Cohorts

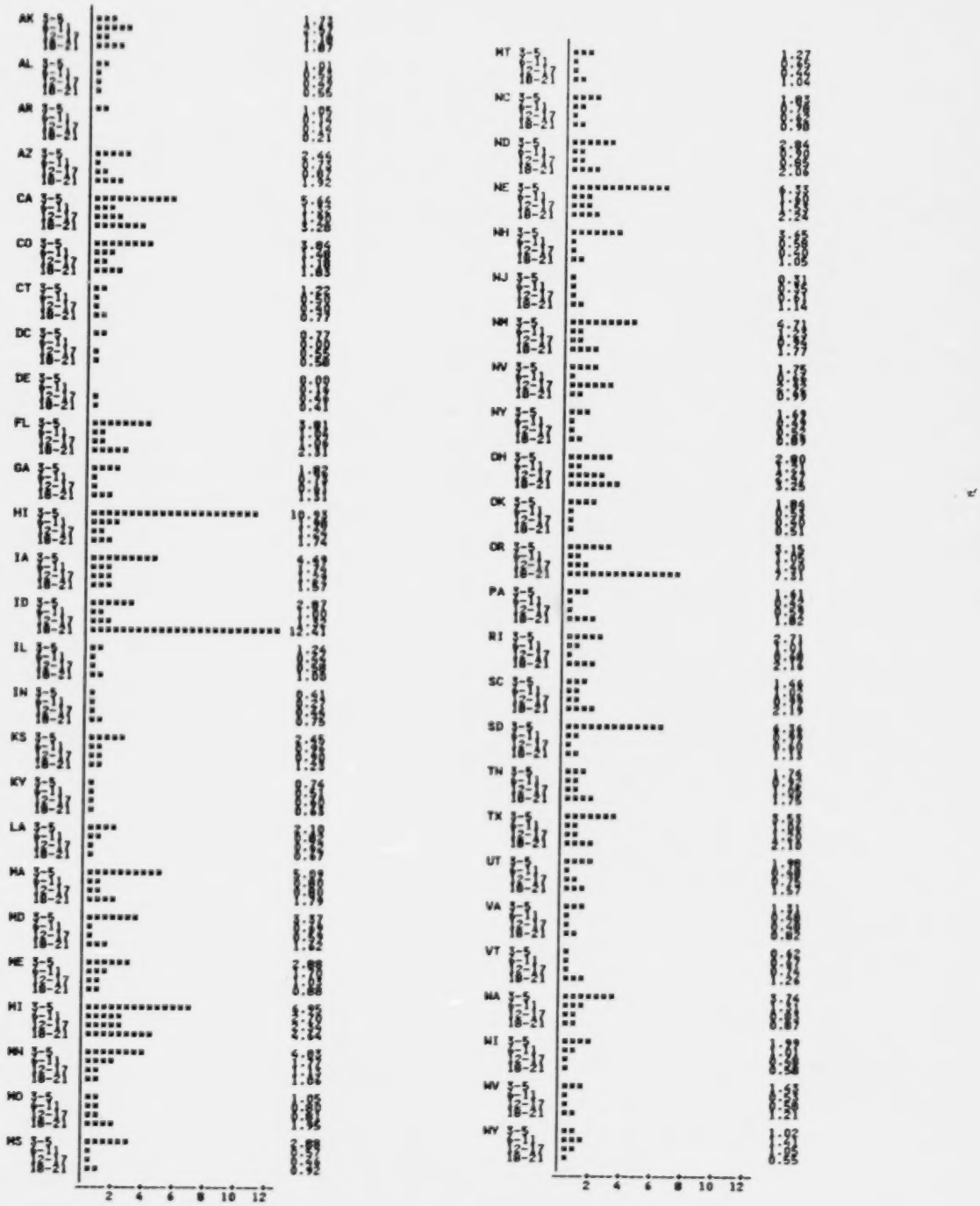
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.19. Percentage of Youth Served with Multiple Handicaps at Four Cohorts



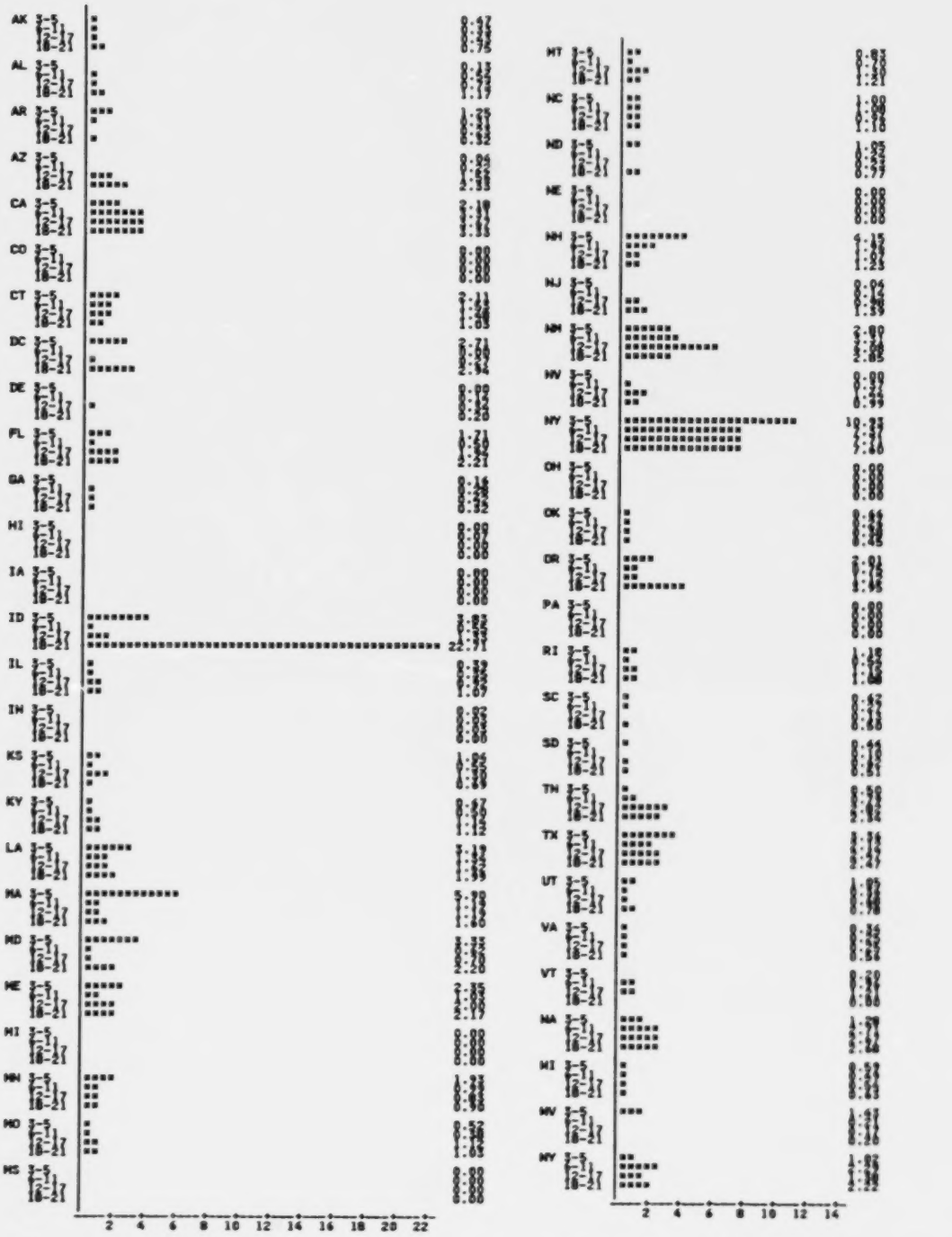
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.20. Percentage of Youth Served with Orthopedic Impairments at Four Cohorts



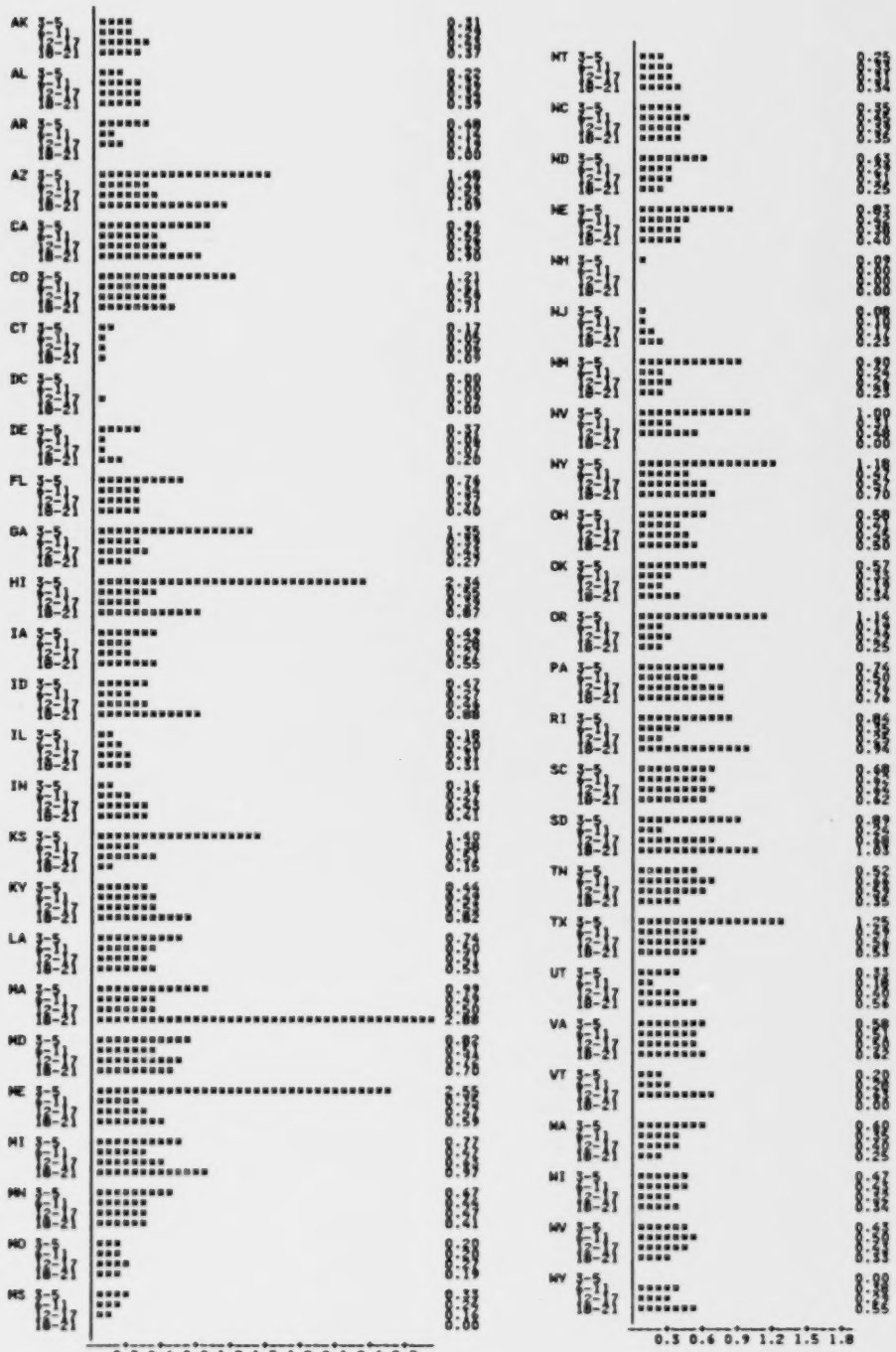
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.21. Percentage of Youth Served with Other Health Impairments at Four Cohorts



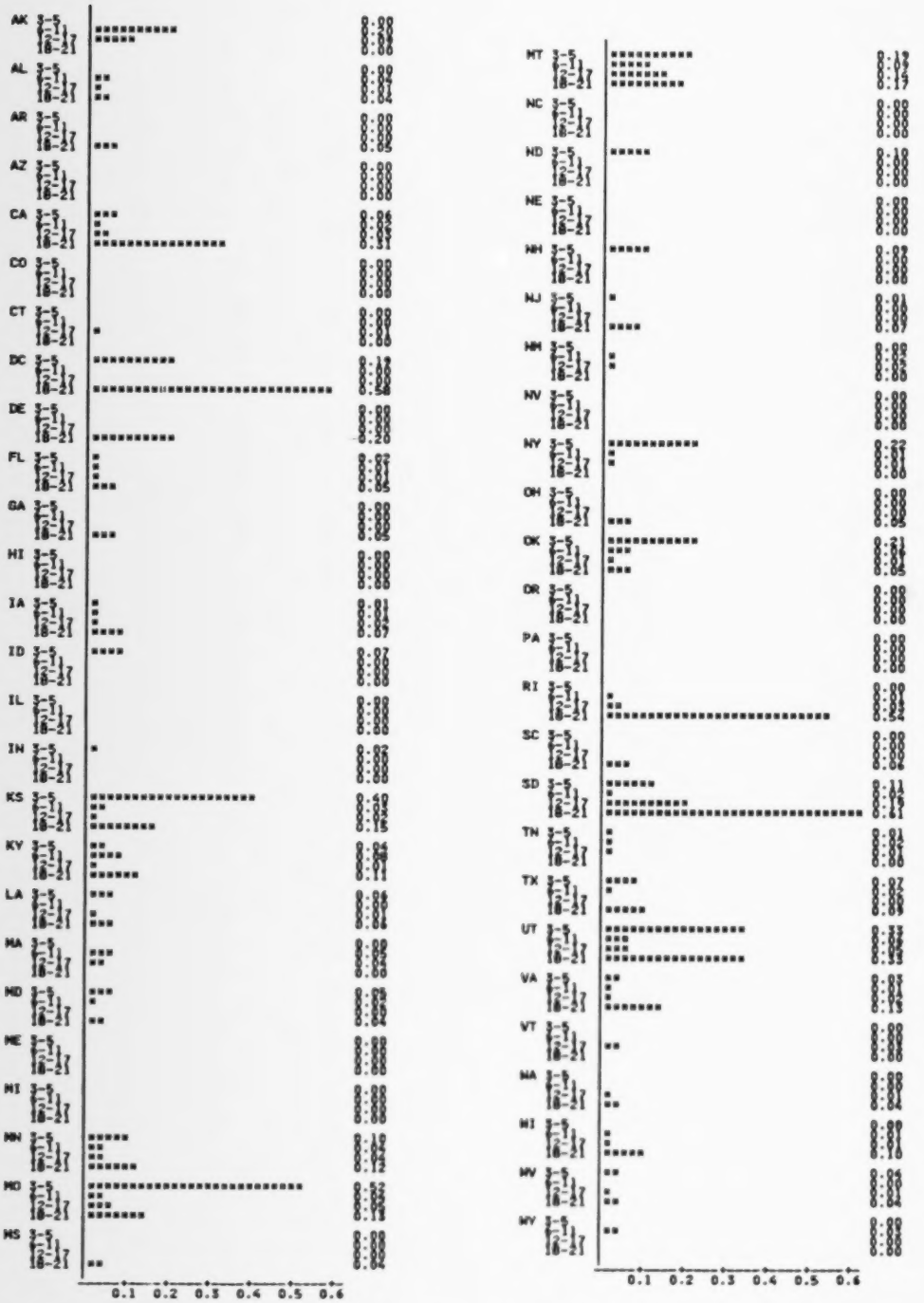
Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.22. Percentage of Youth Served with Visual Handicaps at Four Cohorts



Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

Figure 2.23. Percentage of Youth Served with Deaf-Blindness at Four Cohorts



Source: 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act

3

The Development of a District-Based Longitudinal Follow-Up Study of Special Education Graduates

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During the past five years, it has become apparent that special education students do not fare well after leaving the mandated services of public education (ICD/Harris Poll, 1986; Will, 1983). Unemployment, financial dependence, and shortages of rehabilitative and residential services are commonly cited post-school adjustment problems of special education graduates or school leavers. Given this grim picture, federal and state initiatives have provided fiscal and legislative support aimed at facilitating the transition of these students from school to adult life. One important aspect of this reform movement is the design and adoption of high school curricula that effectively prepare students for employment and an independent adult life.

In this chapter, we tell the story of a first-year collaborative effort between a local special education school district and a university to establish a computerized longitudinal data base. The longitudinal study was designed to examine what students do after leaving school, what

types of jobs they have, and what parts of the special education program contributed most to their successful transition. This information can then be combined with data from school records to analyze the relationships among pupil characteristics, program components, school achievement, and post-graduation adjustment. The study, which will examine over 100 student and program characteristics, will span the next five years and will enable the district to evaluate their special education programs in terms of students' post-school success.

The purpose of this chapter is threefold: (a) to describe the activities involved in developing a district-based longitudinal tracking system; (b) to discuss the advantages and problems of using such an approach to judging program effectiveness and guiding program development; and (c) to present findings from preliminary analyses of the data.

The School District

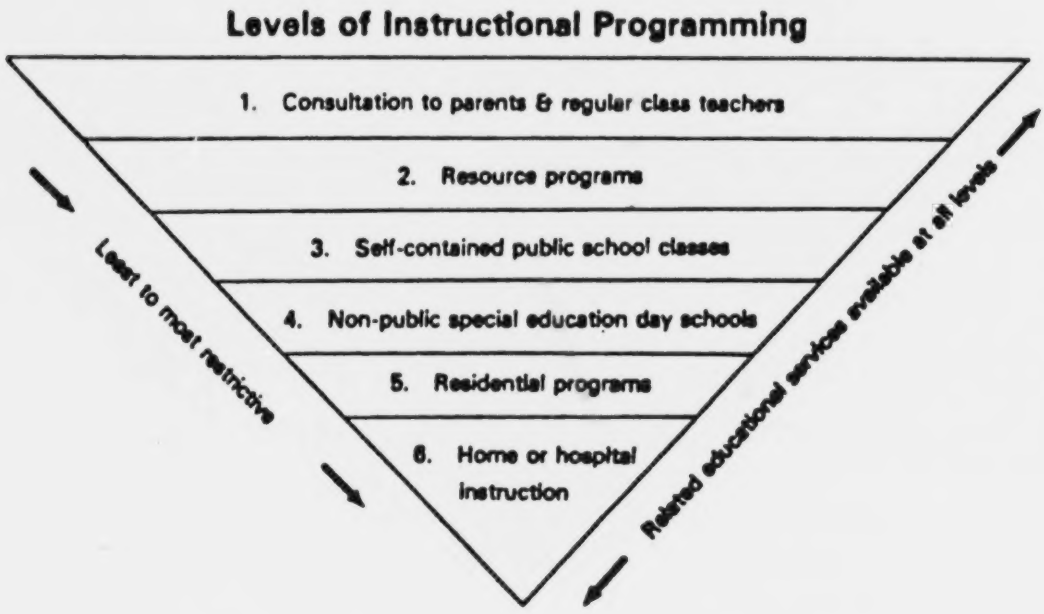
LaGrange Area Department of Special Education (LADSE) is a cooperative of 16 school districts in west Cook and east DuPage counties. LADSE operates with the approval and financial support of the school districts and the Illinois State Board of Education.

A variety of special education services and programs are available in LADSE school districts for students whose difficulties range from mild to severe. Programs are available for students whose ages range from 3 through 21. Just over 3,600 students are served by a professional and paraprofessional staff of 350.

Instructional Programs

Figure 3.1 illustrates the levels of instructional programming offered by the district. Approximately 79% of the students are served at the first two levels and are maintained in regular class programs in their own districts while receiving special instructional assistance. Another 20% of the students are served at level three, spending most of the school day in self-contained classes at age-appropriate public schools. A smaller group, representing 1%

Figure 3.1. Programs Available at LaGrange School District


Levels of Instructional Programming
1. Consultation to parents & regular class teachers
2. Resource programs
3. Self-contained public school classes
4. Non-public special education day schools
5. Residential programs
6. Home or hospital instruction
Least to most restrictive
Related educational services available at all levels

Source: Brochure entitled *Special Education: A Partnership of Parents, Students and Educators.* LaGrange, IL: LaGrange Area Department of Special Education

of the students served, participates in instructional programming in more restrictive public school programs (levels four through six).

Related educational services are available at all levels of instructional programming. These services include school psychology, school health, occupational and physical therapy, school social work, speech therapy, transportation, and supervision.

In April 1986, Paul Ericksen, coordinator of secondary/low incidence programs for the district, contacted Frank R. Rusch, Director of the Transition Institute, to ask if the Institute staff could provide the district with some help in analyzing a data set. The data had been collected during the 1983-84 and 1984-85 school years on two grade cohorts of freshman special education students entering Lyons Township High School as part of the first phase of a longitudinal study conducted by the district. In subsequent years, data will continue to be gathered on all eighth grade students. Once enrolled in high school, special education students will be monitored throughout their secondary years, followed by a one-year post-graduation follow-up to determine post-graduation employment and independent living status.

Technical Assistance

Professors Delwyn Harnisch, Frank Rusch, Laird Heal, and Lizanne DeStefano of the Transition Institute began to consult with the district in October 1986. The initial meetings with district staff were spent clarifying the purposes for which the data base was being developed. The district identified several immediate uses for the information gained in this study. These included: (a) determining the number of special education students who drop out each year, (b) determining the number of students who return to regular education classes, (c) tracking students' movements from one program or service delivery system to another, (d) determining the types of programs provided and the frequency of related services, (e) determining the number of special education students who graduate, and (f) identifying those students who were hospitalized or recommended for nonpublic placement. In addition to these immediate needs, the district identified the following long-term uses for the data: (a) evaluating the effectiveness of secondary program components such as work experience opportunities or community living skills curricula by assessing their relationship with post-graduation outcomes, (b) increasing continuity among junior high and high school LADSE programs through implementation of program components and procedures demonstrated to be effective, and (c) designing new programs and services to address the needs experienced by district graduates or school leavers.

In addition to goal setting, it was also necessary to determine what had been done on the project to date and what resources could be allocated to maintain the data base over the next several years. As was stated earlier, the project was begun during the 1983-84 school year. A data collection form was developed and district teachers began collecting information on all freshman special education students entering Lyons Township High School during 1983-84. During the 1984-85 school year, information was updated for the first cohort and initial data were collected for a second cohort of entering freshmen. During this second year, however, problems arose which seriously hindered continuation of the project. First, overtime salary and release time for teachers had not been budgeted. Teachers were being asked to complete the lengthy data sheets on their own time, in addition to their other responsibilities. This extra burden made it difficult to get data forms for each student that were complete and accurate. As a result, the data collection process was abandoned after the second year.

A second problem occurred in the coding and analysis of the data. This task was assigned to the Central Administration computer center where it was given low priority, below the more pressing tasks of attendance monitoring, issuing report cards, and maintaining school district records for budget and reporting purposes. When district computer staff had time to analyze the longitudinal data, they experienced trouble conducting the first phase of the analysis. A hardware problem caused by flooding put the project on hold for several months. Finally, turnover in the computer staff resulted in termination of the analysis.

Cooperative Agreement

The district then established a cooperative agreement with another university, but that arrangement yielded no analyses. It was after this string of events that the University of Illinois Transition Institute staff became involved in the project.

A necessary first step involved securing the district's financial commitment to the project in terms of staff time, consultant fees, and computer costs. To accomplish this, the Institute staff submitted a plan of action and an accompanying budget to the district. The district agreed to support the activity for the 1987-88 school year.

The action plan outlined six steps that would result in a longitudinal tracking system to monitor special education students beginning in the eighth grade and continuing beyond graduation. The six steps are detailed below:

Step 1. Analyzing existing data. The initial analysis of the data collected already seemed to be a logical starting point. Given the absence of a coding manual for those data already entered into the district computer system, it was decided to reenter raw data from the paper and pencil forms. This activity was begun in February 1987. Initial analyses of the data revealed many missing values. During the period from March 1 to June 1, district staff reviewed records to provide us with some of that information. During the summer school session, two special education teachers were assigned to update the student data for the 1985-86 and 1986-87 school years. These data were made available to the Institute in September 1987.

Steps 2 and 3. Survey design and development of a computerized management system. This activity began in September 1987. To accomplish these tasks, consultation will consist of two to four on-site visits that include meetings between Institute consultants and LADSE administrators and teachers to determine the availability and quality of student and program information, staff access and familiarity with computer equipment, personnel hours allocated to the tasks, and desired capabilities and outcomes of the data collection system. Based on this information, a survey instrument and procedure for data collection will be proposed by the cooperating team from the University of Illinois. The data collection and management system was pilot tested during the 1987-88 school year, with final adjustments during the summer making it operable for the 1988-89 school year.

Step 4. Inservice training. Inservice training will be conducted by Institute staff for LADSE staff regarding the use of the data collection system. Phone and mail consultation will be available to LADSE personnel on an as-needed basis. Data will be collected by LADSE teachers on all secondary students currently enrolled in, or graduating from, LADSE high school programs and on recent graduates.

Steps 5 and 6. Data analysis and reporting. These activities will begin as soon as data collection is underway. Specific analyses to be done will be selected on the basis of the informational needs of the district and the research interests of the University faculty. Results will be reported in a document for internal use by LADSE staff and in a series of professional

presentations and publications. For the first year of operation, the data base will be housed and maintained at the University. Ongoing maintenance of the data base will be the responsibility of LADSE, with University of Illinois consultation continuing to be available in subsequent years of operation.

The following section describes the analysis of the data collected during the first two years of the project. The results of the analyses and the interpretations of those results are included to illustrate some possible uses of such a data base.

Method

Subjects

Complete information was collected on a total of 141 special education students enrolled as entering freshman in Lyons Township High School during the 1983-84 or the 1984-85 school years. These two groups of students were seniors and first-year graduates during the 1987-88 school year.

Instrumentation

Data were collected using a district-designed questionnaire. The questionnaire used a pencil and paper format, and the information was organized into four sections: personal and demographic, initial referral, current program, and post-high school. Within each section, the following specific information was collected:

Personal and demographic information

name	residential status
sex	race/ethnicity
address	primary language
date of birth	parents' marital status

Initial referral information

date of referral	reason for referral
method of referral	standardized test scores
age at referral	primary handicapping condition at referral

Current program information

program type	percentage of days in special education
date entered	minutes per week in related services
GPA	type of vocational programming
attendance	number of mainstream teachers
work experience	number of SST meetings
reason for termination	parent attendance at SST meetings

Post-high school information

employment status	type of job
wages/benefits	residential status
job tenure	method of job attainment
job satisfaction	enrollment in education program

Procedure

Data were collected and updated by teacher consultants, master-level teachers with supervisory duties over multiple classrooms. Each teacher consultant was responsible for completing and updating data forms for those students in the classrooms he/she supervised.

Data Analysis

Data from the individual pen and paper record forms were coded and entered into SAS data sets on the IBM mainframe computer at the University of Illinois. Data were entered

twice and then verified. Missing data were noted. School district personnel were asked to provide complete information where data were noted as missing.

Descriptions of characteristics of the population frequencies, cumulative percentages, means and standard deviations on those variables for which complete data were obtained by July 1, 1987. Box and whisker plots were developed for achievement test data by severity of handicapping condition.

Results

Results from selected analyses are reported in Tables 3.1 and 3.2 and in the text below. The variables were chosen for this report because they had the most complete data. The analyses shown here represent the most basic ways of examining the data sets. As the data base matures and complete data are available on post-graduation status variables, inferential statistics will be used to explore the relationships between program components and post-graduation outcomes.

Background Information

The total sample contained 141 students, 61.7% male (n = 87) and 38.3% female (n = 54). Approximately 90% of the students were white; 8.1% were black; and 1.5% were Hispanic. The majority of the sample had been in special education for most of their school years; 58.7% had been referred between the ages of 5 and 8 (grades K through 3). The second largest group (33%) was referred between the ages of 9 and 12. There were few referrals made after the elementary school years, with only 10 children (8.3% of the sample) entering special education at that time. Most of the children lived in two-parent households (84.4%). Among single-parent households, 11.9% of the parents were divorced and 3.7% reported never having been married.

Table 3.1. Demographic Profile of Participants in LaGrange Special Education Project

Demographic characteristic	N	%
Sex		
Male	87	61.7
Female	54	38.3
Age at referral		
5 - 8	71	58.7
9 - 12	40	33.0
13 - 15	10	8.3
Ethnicity		
White	122	90.4
Black	11	8.1
Hispanic	2	1.5
Parents' marital status		
Married	114	84.4
Divorced	16	11.9
Single	5	3.7
Handicapping condition		
Learning disabilities	64	47.4
Behavior disorder	39	28.9
Mental retardation	17	12.6
Speech/language	5	3.7
Hearing impairment	2	1.5
Educational handicap	2	1.5
Unclassified preschool	2	1.5
Not eligible	2	1.5
Hard of hearing	1	0.7
Physical impairment	1	0.7
Severity of handicapping condition		
Mild	100	76.3
Moderate	27	20.6
Other	4	3.1
Reason for referral		
Other academic difficulties in class	41	30.4
Academic readiness deficit	21	15.6
Attention span	19	14.1
Speech/language delay	13	9.6
Grades	10	7.4
Aggressive/acting-out behavior	8	5.9
Hyperactivity	5	3.7
Gross motor delay	5	3.7
Withdrawal/depression	4	3.0
Homework completion	3	2.2
Peer interaction	3	2.2
Hearing impairment	2	1.5
Orthopedic impairment	1	0.7

Table 3.2. Means and Standard Deviations on Achievement and Intelligence Measures for Total Sample and Selected Subgroups

Group	Deviation intelligence quotient			Total mathematics			Total reading		
	N	M	SD	N	M	SD	N	M	SD
Sex									
Male	83	88.40	11.42	40	6.46	1.89	41	6.85	2.35
Female	53	84.00	15.31	34	5.96	2.04	33	6.56	1.87
Age at referral									
5 - 8	69	87.29	10.99	40	5.83	2.21	37	6.33	2.07
9 - 12	39	89.97	12.08	23	6.77	1.50	25	7.10	2.34
13 - 15	10	88.40	7.76	3	5.50	1.01	3	6.53	1.75
Ethnicity									
White	119	86.48	13.88	63	6.39	1.88	64	6.99	2.08
Black	10	86.10	6.50	5	4.96	2.98	4	4.05	1.11
Hispanic	2	84.00	2.83	2	3.80	1.13	2	3.90	1.27
Parents' marital status									
Married	110	87.28	12.29	60	6.22	2.05	60	6.88	2.16
Divorced	15	80.93	14.70	8	5.84	1.06	8	5.36	1.92
Single	5	81.20	26.57	1	4.60	-	1	5.70	-
Handicapping condition									
Learning disability	62	88.73	8.89	37	6.16	1.85	38	6.56	2.21
Behavior disorder	39	91.59	9.56	20	7.12	1.19	20	7.52	1.90
Mental retardation	12	77.58	18.11	6	4.80	2.37	5	5.28	0.57
Speech/language	5	84.80	3.42	4	4.13	2.97	3	5.83	1.00
Hearing impairment	2	80.50	2.12	1	3.00	-	1	3.00	-
Educational handicap	2	91.50	0.71	1	5.90	-	1	3.40	-
Unclassified preschool	2	69.50	19.09	0	-	-	0	-	-
Not eligible	2	85.50	4.95	1	6.70	-	1	6.60	-
Hard of hearing	1	43.00	-	0	-	-	0	-	-
Physical impairment	1	86.00	-	0	-	-	1	10.90	-
Severity of handicapping condition									
Mild	97	89.65	10.31	58	6.49	1.45	59	6.70	2.11
Moderate	27	80.19	13.85	7	6.41	3.28	8	6.43	2.12
Other	3	57.33	25.79	0	-	-	1	10.90	-
Reason for referral									
Other academic difficulties in class	40	88.92	9.95	24	6.40	1.86	25	5.93	2.09
Academic readiness deficit	20	85.40	10.14	10	5.15	2.20	9	5.71	1.20
Attention span	19	89.05	8.98	12	6.54	1.79	12	7.85	2.16
Speech/language delay	13	73.62	18.32	6	5.30	2.85	5	6.48	0.84
Grades	10	88.40	7.20	8	5.93	1.38	8	6.59	2.34
Aggression/acting-out	8	93.13	11.04	2	8.00	1.27	2	9.00	0.28
Hyperactivity	5	95.00	8.03	3	6.50	0.56	3	7.27	2.37
Gross motor delay	4	53.00	20.38	0	-	-	0	-	-
Withdrawal/depression	4	91.25	8.42	2	7.70	1.27	2	7.80	0.14
Homework completion	3	95.00	13.45	1	8.40	-	1	10.20	-
Peer interaction	3	93.67	6.81	1	6.10	-	1	8.80	-
Hearing impairment	2	80.50	2.12	1	3.00	-	1	3.00	-
Orthopedic impairment	1	86.00	-	0	-	-	1	10.90	-

Handicapping Condition

Students with learning disabilities were the largest group, comprising 47.4% of the sample. Students with behavior disorders made up the next largest group (28.9%), followed by students with mental retardation (12.6%). Each of the remaining handicapping conditions occurred in less than 5% of the sample.

Given the breakdown by handicapping condition described above, it is not surprising that over 76.3% of the students in the sample were described as having mild handicaps. Just over 20.6% had moderate handicaps, and the remaining 3.1% had severe handicaps.

Reason for Referral

Almost one-third (30.4%) of the students were referred for academic difficulties in class. For those students referred in the early grades, academic readiness deficits (15.6%) and speech and language delays (9.6%) were the most common reasons for referral. Problems with attention was cited as the reason for referral in 14.1% of the sample cases. All other reasons for referral accounted for less than 10% of the sample and included: grades, aggressive/acting-out behavior, hyperactivity, gross motor delay, withdrawal/depression, homework completion, peer interaction, hearing impairment, and orthopedic impairment.

Type of Program Placement

Almost one-half of the students were served in resource rooms (n = 64; 48.9%). The second largest group was served in self-contained cross-categorical classrooms (24.4%). Regular class placement with resource teacher monitoring, nonpublic placements, and specialized self-contained classrooms (behavior disorders, emotional disturbance, severe and profound handicaps) each served less than 10% of the sample.

Achievement and Intelligence Test Scores

Table 3.2 presents means and standard deviations on achievement and intelligence measures for selected subgroups of the sample. The test scores were obtained from a single administration of the Otis-Lennon School Ability Test (OLSAT) in conjunction with the Stanford

Achievement Test (7th Edition--SAT). The OLSAT yields a deviation intelligence quotient (DIQ) or school ability index with a mean of 100 and a standard deviation of 15. Grade equivalents from the reading and mathematics sections of the SAT are used in this analysis. The tests were administered in the last month of the eighth grade. In our analysis, a grade equivalent of 9.0 was used to indicate average performance on the test.

Background Information

Males and females showed great similarity in terms of DIQ score, and mathematics and reading composite achievement test scores. The mean DIQ was below average for both groups, and achievement scores were two to three years below expected grade level. No difference was seen in DIQ scores for black and white groups, but reading and mathematics scores showed that black students were more than a full year behind their white counterparts in these two academic areas.

In terms of age at referral, unequal group sizes make comparisons difficult. It appears that although all age groups had approximately the same DIQ scores, those students referred during junior high school exhibited the most serious deficits in both mathematics and reading when compared with the other two groups. Students referred between the ages of 9 and 12 showed the smallest academic deficits, scoring less than one year below expected grade level in reading and slightly more that one year below expected grade level in mathematics.

Handicapping Condition

Students with behavior disorders scored highest on the school ability test ($M = 91.59$; $SD = 9.56$). Students with learning disabilities also scored within the normal range of ability ($M = 88.73$; $SD = 8.89$). The mean score for students with mental retardation on this test ($M = 77.58$; $SD = 18.11$) suggests that the students in the sample represent higher levels of functioning for persons with mental retardation.

On the measures of academic achievement, all groups scored below their current grade level. The smallest discrepancies (one to two years) were seen in the group of students with

behavior disorders. Students with mental retardation exhibited academic deficits averaging three to four years behind grade level. This may actually be an underestimate because half of this group were not administered the achievement portion at all because of their low skill level. Students with learning disabilities scored on the average two and a half to three years below grade level.

In terms of broad levels of functioning, students with mild handicaps had the highest mean score ($M = 89.65$) on the ability test. Students with moderate handicaps scored approximately one standard deviation lower than their peers with mild handicaps. Little difference was seen in reading and mathematics achievement scores between these two groups, probably because most students with moderate handicaps did not take the achievement tests, and the mean score for that group represents the performance of its highest functioning members.

The group of students with severe handicaps is very small ($n = 3$). The mean IQ score for this group (57.33) is much lower than the other two groups, and the large standard deviation (25.79) indicates high variability among the students in this group. All students with severe disabilities were exempt from the academic achievement portion of the test.

Referral to Special Education

Ability and achievement test data were then broken up according to reason for referral to special education programs. Once again, small cell sizes made comparative interpretation difficult, but some general statements can be made. Categories of reasons for referral are grouped into three clusters to aid interpretation.

The first cluster of reasons for referral, categories of students referred for academic problems (i.e., academic difficulties, academic readiness deficits, and grades), had ability scores in the below to low average range (85.40 to 89.05). All three categories showed deficits in mathematics and reading; grade equivalent mean scores were a year and a half to two and a half years below current grade level. The group that was referred early in their school

program for having an "academic readiness deficit" showed the greatest deficits in the eighth grade in reading and mathematics (5.15 and 5.71, mean grade equivalents, respectively).

A second cluster of referral reasons, those having to do with social and emotional problems, was made up of the following categories: aggressive/acting-out behavior, hyperactivity, withdrawal/depression, homework completion, peer interaction, and attention span. The mean ability scores of these groups were in the low average range (89.05 to 95.00), somewhat higher than the previous cluster. Although the number of students in these categories was small, it can be said that students in this cluster appeared to have less academic difficulty than the previous group. In the second cluster, grade equivalent scores ranged from a year below grade level to two years and a half above grade level.

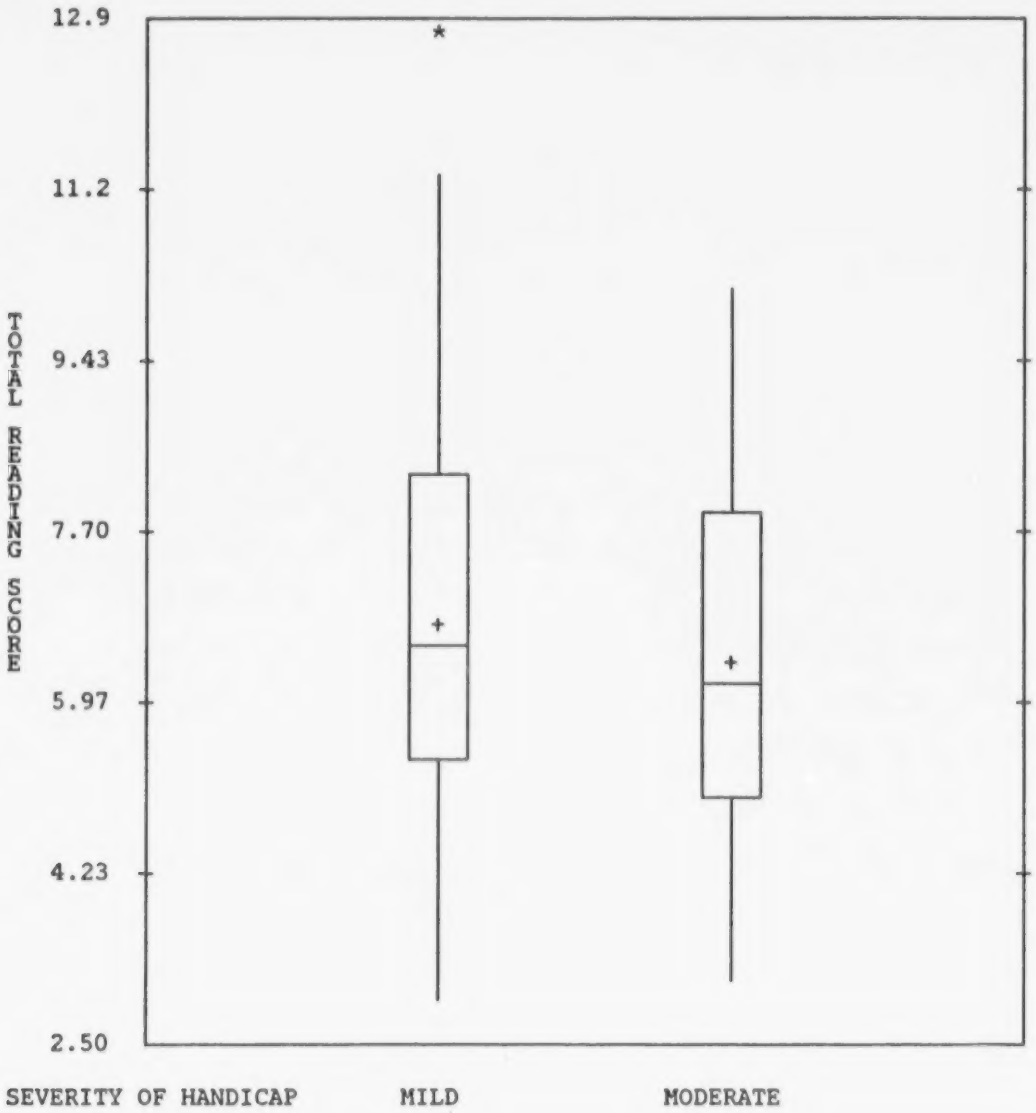
The third cluster included categories of students referred for speech and language delays or gross motor delays. Their mean ability scores were lower than the groups discussed previously (73.62 and 53.00, respectively). Once again, the large standard deviations associated with these scores indicated a great deal of within-group variation in ability. Academic achievement scores are difficult to interpret for these categories because this portion of the test was administered to so few students.

Box and Whisker Plots

Box and whisker plots were drawn to compare students with mild handicaps to students with moderate handicaps in terms of ability scores, and mathematics and reading achievement test scores. (Those persons not familiar with box plots should turn to Appendix C for directions on how to read them.)

The box plots in Figure 3.2 reflect the intelligence test scores of students with mild and moderate handicaps. Ability scores for the group with mild handicaps ranged from approximately 40 to 112. Scores for the group with moderate handicaps ranged from 46 to 100. Although the median of the two groups differed, there was considerable overlap in the range of scores between the two groups, with the lower 50% of the group with mild handicaps obtain-

Figure 3.2. Box Plots of Total Reading Scores by Severity of Handicap



ing similar scores to the upper 50% of the group with moderate handicaps. The mild group showed less variance than the moderate group. The mean score of the mild group was lowered by the presence of two extreme outlying scores (40 and 49). These scores may have resulted from an error in school records.

Figure 3.3. Box Plots of Total Mathematics Scores by Severity of Handicap

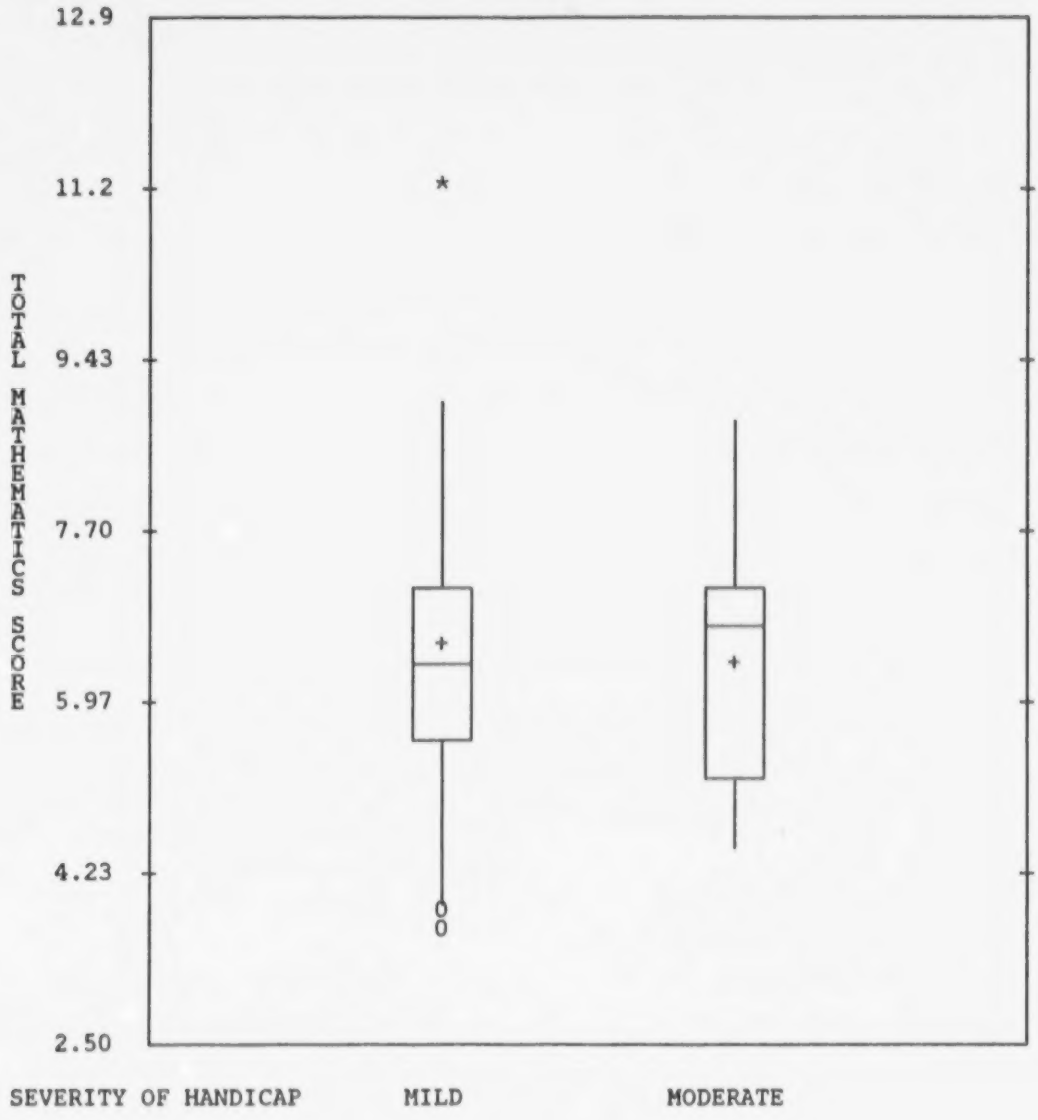
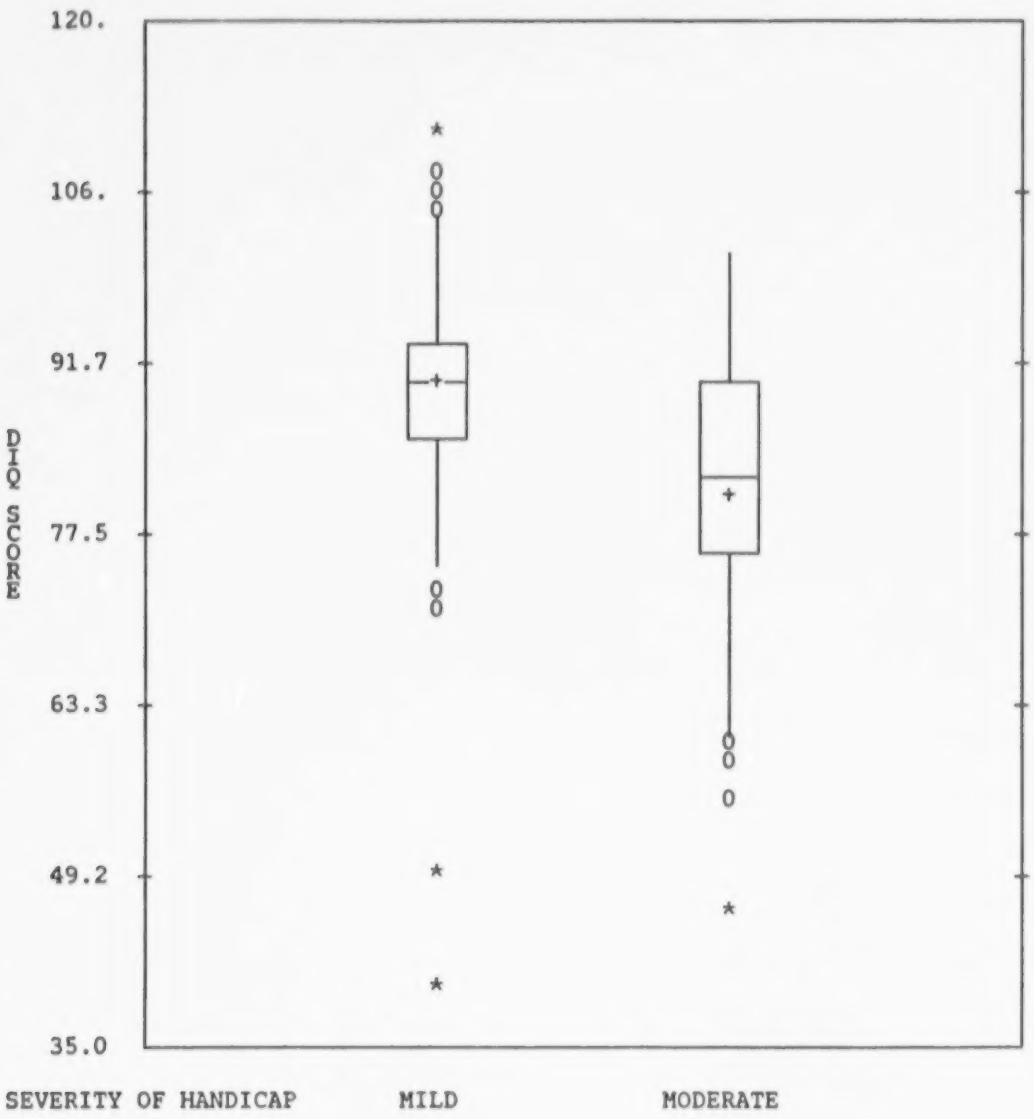


Figure 3.3 shows box plots comparing the same groups according to mathematics achievement scores. The graphs indicate that the two groups performed almost identically on this test. These findings are puzzling until one considers that 75% of the students in the moderate group were not administered the achievement portion of the test. This box plot represents only the performance of the highest functioning students in the moderate group. This

Figure 3.4. Box Plots of DIQ Scores by Severity of Handicap



comparison illustrates a point brought up in the previous figure: there is considerable overlap between the upper quartile of performance in the moderate group and the lower quartiles of performance in the mild group.

Figure 3.4 compares both groups on reading achievement scores. Once again, the box plot for the moderate group represents the scores of students whose level of functioning placed them in the top quartile of group. Despite this qualification, we see that the mean, median, and range of reading scores are lower for the moderate group.

Discussion

Although we have just begun work to establish the data base at LaGrange, the payoffs of having such a system are already recognizable. The analyses presented here raise several issues that have implications for programs and policy. The substantial overlap in achievement characteristics between mild and moderate groups gives rise to an investigation of those factors, other than achievement, that determine program placement. The analyses also indicate that there may be little movement out of special education. Most of the students in the sample (selected in the ninth grade) had entered special education before first grade or in the early elementary years. It is distressing to see that despite the length of time spent in special education, considerable academic delays exist in mathematics and reading achievement. Of course, we must recognize the limitations of judging program effectiveness on the basis of academic achievement test scores alone. As the data base expands to include post-graduation follow-up information, we will be able to examine "real life" indicators of program success.

A final point involves the differing achievement levels of students with different handicapping conditions. Because the most popular placement option in the district is the cross-categorical resource room, we must ensure that individualized programs make it possible to accommodate different educational needs in the same classroom.

As the data base is updated, plans will be made to use correlation and multiple regression techniques to understand the relationships among student characteristic and school

program information with post-graduation outcomes. The results of these analyses will be included in subsequent editions of the *Digest*.

Recommendations

The use of a longitudinal data base for tracking the secondary school and post-graduation progress of special education students is becoming a popular program evaluation option in local education districts across the country (Dowling & Hartwell, 1987). The process of establishing such a data base can be complex and time consuming and fraught with unforeseen pitfalls and setbacks. Consideration of the following issues might alleviate some of these problems:

1. Ample time. Allow ample time for designing and pilot testing data collection instruments and procedures. The time spent in pilot testing will be saved in dealing with collection and coding ambiguities.

2. Team approach. Use the team approach for designing instruments and procedures. A likely team might consist of a district administrator, outside consultant, district computer resource person, those people who will be collecting data, and a representative from clerical staff or those persons who will be entering the data onto the computer.

3. Data collection. Data collection duties must be incorporated into district staff's job responsibilities, and reasonable time must be allotted for its completion. This may mean reduction in teaching load to allow for more "free time" during the school year or the option of working additional weeks during summer vacation. One person should be designated as the system monitor and should keep in touch with what is happening on the project by regular meetings of the involved staff.

4. Internal operation. When possible, all aspects of the project should be kept in-house to eliminate the delays as data and reports are shipped back and forth between the district and any outside institutions who have subcontracted portions of the task. When designing a longitudinal system, it is often wise to forego complex statistical analyses and elaborate programming and to opt for a system that is simple to use and can provide clear and timely information to answer basic questions that a district might have.

5 System accessibility. The system should be accessible to persons at various levels within the organization so that questions can be answered quickly with up-to-date information. Analyses of data should not be limited to formal reporting (annually or semiannually), but should be in response to questions and problems as they arise. This goal requires that staff receive training so that they can access and analyze the data as needed. A second requirement is that the data base must be installed in a system that is readily accessible to staff. The data base must be updated on a regular basis, perhaps at the end of each quarter or semester.

6. Data base network. Link the contents of the data base to other data bases maintained by the district. Most districts are required to keep records on numbers of handicapping conditions served, student achievement, and attendance. The longitudinal data base should not duplicate these efforts, but should be capable of interfacing with existing data bases.

7. Information utilization. Establish the use of information from the data base at meetings and other planning activities. To explore the utility of the system fully, information from the data base should be presented as part of multidisciplinary team, staff, and board meetings.

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4

Post-School Employment Patterns of Handicapped and Nonhandicapped Graduates and Dropouts

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Regardless of the debate that centers on the growing imbalance between education and work, the prevailing opinion and general rhetoric suggest that those who attain more and "better" schooling are in an advantageous position to obtain higher earnings, to hold jobs with higher prestige, and to be employed more often than individuals with lower educational attainment (Borus, 1982; Jencks et al., 1979; Levin, 1972; Rumberger, 1984). Sociological research that embraces status attainment theory has demonstrated that education, occupation, and earnings are interrelated. As a result, the high school years may be considered an initial, critical phase of a life-long process of socioeconomic achievement (Featherman, 1980). Although most research does not study the issue of handicap status directly, the importance of school in influencing later life goals should not be considered any less important for youth with handicaps than for youth without handicaps.

Although the ideals of equal educational opportunity were at the foundation of historic special education legislation, a great number of secondary-aged youth have not attained parity with their peers (National Coalition of Advocates for Students, 1985). Despite improvements and expansion in services for most students with handicaps since the passage of P. L. 94-142, the provision of appropriate educational services remains problematic for a substantial number of students with handicaps. With a history of inadequate educational preparation, these students are more seriously handicapped as they "age out" of school because of their chronic dependence on society and their uncertain future in the job market (Halpern, 1973; Hasazi, Gordon, & Roe, 1985; Mithaug & Horiuchi, 1983; Porter, 1982; Rusch, 1986; Wehman, Kregel, & Zoller, 1984; Wilcox & Bellamy, 1981).

In order to improve the secondary school curriculum that prepares youth for employment, it is critical to begin to identify significant characteristics of individuals, schools, and communities associated with this passage. At the current time, there is an acute shortage of reliable data that include youth with handicaps. Along with this shortage, there is a need for information concerning the rate of attrition and characteristics of dropouts who have handicaps. There is also a need to analyze extant studies that include students identified as handicapped. The current popularity of follow-up studies coincides with the federal special education transition initiative, yet these studies have focused primarily on local and state concerns, and often only cover selective high incidence handicaps.

The primary purpose of this research was to investigate selected post-school employment patterns of those high school graduates and dropouts who reported having handicaps. Specifically, this research examined factors associated with rates of job participation, kind of job held, hours worked per week, income earned, and duration of employment in the first job after high school. Both descriptive and inferential methods were used to examine these factors associated with post-school employment.

This research used one of the largest and most current national data resources available to study the transition of secondary-aged youth from school-to-work or postsecondary educa-

tion. The data obtained for this research are from the *High School and Beyond* (HSB) second follow-up data files (Office of Educational Research and Improvement, 1986), part of the Center for Statistics (formerly the National Center for Education Statistics - NCES) National Longitudinal Studies program on the educational and occupational experiences of high school-aged youth.

Procedures

Extant Data Base

HSB is a national longitudinal study initiated in 1980 for the NCES by the National Opinion Research Center at the University of Chicago. Students who were sophomores and seniors in 1980 were selected using a two-stage, probability sample. The 1980 sophomore cohort formed the sample for this study as they moved from school to work or postsecondary education, as there were more descriptive high school-related data and subsequent information on graduation status (National Center for Education Statistics, 1984).

Sampling Constraints

According to Owings and Stocking (1985), there are three details of the sampling scheme that limit the definition of students with handicaps in the data. First, the student population for the survey was defined as students who were enrolled in high school programs leading to graduation and a diploma. This definition eliminated from the sampling frame all students who were in nondiploma programs (leading, for example, to attendance certificates or certificates of completion), thereby eliminating one subset of students often found to have a higher incidence of handicaps.

Second, although attempts were made to accommodate such problems, most students had to be able to read and to fill out the questionnaires themselves. Thus, a second subset was also largely excluded. Third, because NCES was concerned that no students be made uncomfortable by participating, any students drawn into the sample who were considered by

teachers to be "at risk" were excluded, which may have eliminated some of the students with emotional or mental handicaps. In addition, the estimated 39,000 secondary school students in residential schools for exceptional students were not eligible for the study. The sample also excluded students with multiple handicaps, mental retardation, and serious emotional disturbances who were enrolled full-time in special education programs not leading to a diploma.

Finally, with regard to the sampling constraints, it is important to note that HSB's attrition rate may underestimate the number of dropouts usually reported in the literature (Novak & Dougherty, 1979; Plisko & Stern, 1985). The initial data gathering was begun with sophomores in the spring of 1980 and followed up when they were seniors in the spring of 1982, which means that some members of the class of 1982 had dropped out before the first survey and others failed to complete their senior year (Pallas & Verdugo, 1986; Wehlage & Rutter, 1984). In addition, approximately 12% of the original sample were absent on the survey day (National Opinion Research Center, 1980). Absenteeism among potential dropouts is well documented and is often used in surveys and predictive instruments to identify potential dropouts. Therefore, measure of the number of dropouts surveyed may not be entirely accurate.

Definition of Handicap

One limitation worth noting was the definition of handicap used in HSB. As a whole, definitions have plagued the field of special education for decades, and lack of consistency in usage has complicated numerous studies and tabulation efforts (General Accounting Office, 1981; Kiernan & Bruininks, 1986). In contrast to the P.L. 94-142 definitional guidelines, students in the sample were asked (in self-administered surveys) whether they had any of seven specific handicaps; whether they had a condition that limited the kinds or amount of work or education they could do; and whether they participated in special programs for students with physical or educational handicaps. The following specific handicapping conditions were considered: specific learning disabilities, visual handicaps,[1] hearing impairments, deafness, speech disabilities, orthopedic handicaps, and other health impairments. For the purpose of this study, only those students who selected one specific handicapping condition were included. In addition, following the work of Gregory, Shanahan, and Walberg (1984), the two

Table 4.1. Sample Size of Groups Studied in *High School and Beyond*

Group	N
Dropouts	
Without disabilities	1,223
With disabilities	920
Graduates	
Without disabilities	6,620
With disabilities	4,000
Specific disability	
Learning disabilities	324
Visual impairments	1,799[a]
Hearing impairments	301
Speech impairments	198
Orthopedic impairments	134
Health impairments	920

a: See note 1.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores.

categories of deafness and hearing impairments were merged into the more inclusive category, hearing impairments. Table 4.1 presents the sample sizes of the groups studied in the data set.

Results

Incidence of Dropping Out for Specific Handicapping Conditions

Data from HSB regarding dropping out show that specific groups of individuals, such as those who identified themselves as having learning disabilities, or hearing, health, or speech impairments had significantly higher attrition rates (37%, 28%, 26%, and 23%, respectively), than the nonhandicapped sample (18.6%). As mentioned earlier, because of the timing of the

Figure 4.1. Frequencies and Percentages of Youth by Specific Handicapping Condition and Graduate Status

Specific disability	Graduation status	Percentage	Frequency	Percentage
Learning disabilities	Dropout	**********	116	36.59
	Graduate	**********	201	63.41
Visual impairments	Dropout	******	268	14.90
	Graduate	**********	1,532	85.10
Hearing impairments	Dropout	**********	105	28.30
	Graduate	**********	266	71.70
Speech impairments	Dropout	**********	53	23.35
	Graduate	**********	174	76.65
Orthopedic impairments	Dropout	**********	31	19.14
	Graduate	**********	131	80.86
Health impairments	Dropout	**********	231	25.47
	Graduate	**********	676	74.53

10 20 30 40 50 60 70 80

Percentage

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores.

study these rates should be considered a conservative estimate of the dropout rate of all respondents. Data on the dropout versus graduation rates for specific handicapping conditions are given in Figure 4.1.

Employment Status for Individuals with Specific Handicapping Conditions

Figure 4.2 gives the frequencies and percentages of the employment status of youth with handicaps by specific handicapping condition. The groups with the highest percentages of part-time employment were youth with visual or orthopedic impairments (32.07% and 32.89%, respectively). Youth with learning disabilities had the lowest percentage of part-time employment (17.13%). Groups of youth with learning disabilities, hearing impairments, or speech impairments had higher percentages of full-time employment than youth with other handicaps. This paralleled the pattern found for involvement in postsecondary education. Ironically, these

Figure 4.2. Frequencies and Percentages of the Employment Status of Youth with Specific Handicapping Conditions in *High School and Beyond* (N = 3,646)

Specific disability	Employment status	Percentage	Frequency	Percentage
Learning disabilities	Full-time job	**********	119	41.61
	Part-time job	********	49	17.13
	Unemployed	*****	30	10.49
	Not in labor force	**********	88	30.77
Visual impairments	Full-time job	**********	567	33.49
	Part-time job	**********	543	32.07
	Unemployed	**	65	3.84
	Not in labor force	**********	518	30.60
Hearing impairments	Full-time job	**********	136	41.34
	Part-time job	**********	79	24.01
	Unemployed	****	27	8.21
	Not in labor force	**********	87	26.44
Speech impairments	Full-time job	**********	90	41.67
	Part-time job	**********	46	21.30
	Unemployed	****	16	7.41
	Not in labor force	**********	64	29.63
Orthopedic impairments	Full-time job	**********	46	30.87
	Part-time job	**********	49	32.89
	Unemployed	**	7	4.70
	Not in labor force	**********	47	31.54
Health impairments	Full-time job	**********	285	33.18
	Part-time job	**********	227	26.43
	Unemployed	****	65	7.57
	Not in labor force	**********	282	32.83

10 20 30 40

Percentage

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores.

groups, along with the group with health impairments, had higher percentages of unemployment than groups with visual or orthopedic impairments. The highest percentage of unemployment was found among youth with learning disabilities (10.49%). The percentages of youth who were not in the labor force were highest for youth with orthopedic or health impairments (31.54% and 32.83%, respectively), and lowest for youth with hearing impairments (26.44%).

Table 4.2. Results of the ANOVAs Performed on Duration of Employment, Hourly Earnings, and Hours per Week on the First Job by Specific Handicapping Condition

	Duration of employment (years)		Hourly earnings (dollars)		Hours worked per week	
	M	SD	M	SD	M	SD
Learning disabilities (LD)	1.46	1.42	4.34	2.70	35.07	14.99
Visual impairments (VI)	1.39	1.39	3.83	2.00	31.50	14.25
Hearing impairments (HR)	1.35	1.39	4.05	2.25	36.43	15.99
Speech impairments (SI)	1.49	1.43	3.88	2.06	33.91	15.87
Orthopedic impairments (OI)	1.44	1.42	4.47	3.16	30.87	15.45
Health impairments (HL)	1.35	1.36	3.98	2.29	32.65	14.29
F-value	0.54		3.69		7.52	
Degrees of freedom	5, 3169		5, 2876		5, 3117	
Probability	.7429		.0025		.0001	
Scheffe post hoc test	ns		LD OI > HL VI SI		HR > VI OI	

ns: not significant

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores.

Duration of Employment, Hourly Earnings, and Hours Worked per Week During the First Job

ANOVAs on the youth who reported a specific handicapping condition yielded significant differences among the groups in hourly earnings and in hours worked per week, but not in duration of employment (see Table 4.2). Results of the Scheffe post hoc comparison test indicated that individuals with learning disabilities or orthopedic impairments had significantly higher earnings than individuals with health, visual, or speech impairments. Individuals with hearing impairments were not included in this test of significance. With regard to hours worked per week, the only significant difference was that individuals with hearing impairments worked longer hours than persons with visual or orthopedic impairments. Comparisons with all other persons with handicaps were not significant.

Discriminant Function Analysis

As a significant ANOVA was found between the four broad groups and, additionally, with the specific handicapping conditions, the question of which variables discriminate among the groups remained. Tatsuoka (1971) recommends the use of discriminant analysis procedures as a follow-up to determine the best linear combination of variables (i.e., a weighted sum) which will maximally differentiate the groups in question. The procedure provides a ranking of the groups in terms of a linear combination of variables and also provides individual weights assigned to the variables. The pattern of weights indicates the direction and magnitude of each variable's contribution in discriminating among the groups.

Before the analysis was initiated, the categorical variables for employment status and first job occupational title had to be transformed into a series of dummy-coded variables.[2] In an attempt to partial out the effects of background variables, the following background, contextual, and school achievement variables were statistically controlled for in the analyses: gender, socioeconomic status, ethnicity, type of high school community, postsecondary educational involvement, test composite score, high school grade point average, and amount of time spent on homework per work.

Discriminating nonhandicapped and handicapped graduates and dropouts. The discriminant analysis for differentiating graduates and dropouts with and without handicaps yielded two significant discriminant functions. The composition of these functions as well as group means on these functions are reported in Table 4.3 and plotted in Figure 4.3. Using a stepwise method, the four labor market variables of full-time employment, part-time employment, subprofessional jobs, and hours worked per week were found to be significant discriminators.

With regard to the first discriminant function, the results suggested several findings. First, the standardized canonical coefficients indicated that the dropouts with and without handicaps differed most from the graduates with and without handicaps on the linear combination of the set of variables defined by the four labor market variables listed in the first col-

Table 4.3. Discriminant Analysis of Labor Market Variables for Youth by Graduate and Handicapping Status

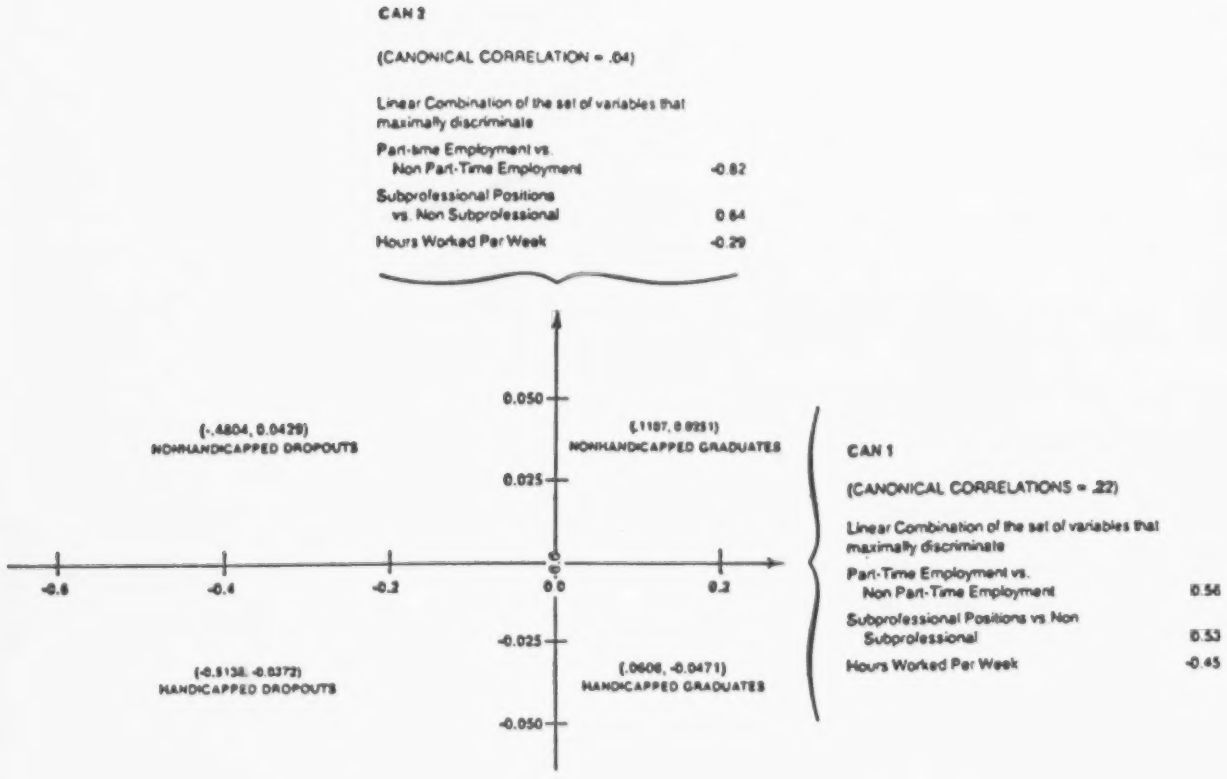
Labor market variables	Standardized canonical coefficient: First discriminant function	Standardized canonical coefficient: Second discriminant function
Part-time/not part-time job	0.56	-0.82
Subprofession/nonsubprofessional job	0.53	0.64
Hours worked per week	-0.45	-0.29
Full-time/not full-time job	0.06	0.05

Grouping by graduate and handicapping status	Mean score: First discriminant function	Mean score: Second discriminant function
Dropouts		
With handicaps	-0.51	-0.04
Without handicaps	-0.48	0.04
Graduates		
With handicaps	0.06	-0.05
Without handicaps	0.12	0.03

Source: *High School and Beyond,* Second Follow-up of 1980 Sophomores.

umn of Table 4.3. It was this set of variables that maximally differentiated the four groups under consideration. Second, the positive graduate group means on the first discriminant function illustrated that the graduates were higher on all the discriminant function variables that were weighted positively. For example, graduates with and without handicaps were more likely to be in subprofessional positions (clerical and sales) as opposed to nonsubprofessional positions, more likely to be in part-time employment versus nonpart-time employment, and likely to be working fewer hours per week (as denoted by the negative sign). Overall, the first discriminant function had a moderate size canonical correlation (canonical correlation = .22,

Figure 4.3. First and Second Discriminant Functions of Labor Market Variables for Youth by Graduate and Handicapping Status



Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores.

$p < 0.0001$). However, before any functions were removed, Wilks' lambda was 0.952, which indicated that little discriminating power existed in the variables being examined.

The second significant discriminant function for graduates and dropouts with and without handicaps had a uniquely different configuration as depicted in the second column of Table 4.3 and plotted in Figure 4.3. First, the standardized canonical coefficients indicated that students with handicaps differed most from nonhandicapped students on the linear combination of the four labor market variables. Second, the positive means for the nonhandicapped group on the discriminant function illustrated that nonhandicapped students were higher on all the discriminant function variables that were weighted positively. For example, nonhandicapped students were more likely to be in subprofessional positions, as opposed to nonsubprofessional positions (such as operatives, laborers, service sector trades), and less likely to be in part-time employment than their peers with handicaps. Overall, this second discriminant function had the same negligible canonical correlation as the first discriminant function discussed earlier (canonical correlation = 0.04, $p < 0.0001$). Figure 4.3 illustrates the spatial configuration of the two discriminant functions derived from plotting the group centroids.

Discussion

The purpose of this research was to study selected post-school employment patterns of young adults with specific handicaps. The findings of the study serve both to confirm and extend previous evidence in the literature on the occupational performance of selected groups of young adults with mild handicaps. Based on the results of this study, it is apparent that certain patterns exist in selected combinations of employment measures that suggest lower levels of achievement and performance among individuals with handicaps in comparison to individuals without handicaps.

As this study involved a sample of youth with various self-reported handicaps, limited generalizations from the conclusions can be drawn about the actual educational and employment benefits and limitations experienced by those individuals diagnosed as having disabilities by trained clinicians or practitioners. However, the data appear to be representative for nearly all the specific groups on the basis of detailed examination of supplemental cognitive, psychological, and teacher-supplied data (Owings & Stocking, 1985).

Although the analyses focused on only the first job after high school, the resulting patterns may well affect the life-long aspirations of individuals in these various groups. For example, according to the findings, young adults graduating from or dropping out of high school were not homogeneous in their labor market performance. The overall findings of this study suggest that individuals who reported having mild handicaps made only a moderate adjustment to the labor market when compared to the adjustments of their nonhandicapped peers.

Dropping Out and Students with Handicaps

Within this sample, the findings suggest that the impact of graduation status is stronger than that of handicap status on labor market indicators. For example, regardless of handicap status, the dropouts were more likely than their graduate peers to be unemployed or not in the labor force after leaving high school (see Figure 4.2). It is important to remember that the categorical choices made by the respondents do not necessarily conform to predetermined definitions. It is possible that the choice "not in the labor force" also includes some individuals who were unemployed. The choice of a category was purely an individual one.

The implications of this finding for education and youth employment policy and practice suggest the importance of establishing a more systematic procedure for identifying potential dropouts and providing comprehensive programs to retain students in school. Previous studies show that dropout-prone students need to be identified early enough in their school careers so that some form(s) of positive intervention can be initiated before students enter high school (Novak & Dougherty, 1979; Weber, 1986). In addition, it is vital that more special-

ized guidance and counseling services are made available to these students before, at the point of, and after their entry into high school (Weber, 1986).

Educators should be made aware of the factors that might lead students to drop out. Rarely is such information collected and systematically used for remedial programming and counseling. For special educators, it is imperative that they realize that students who have mild handicaps and are capable of being mainstreamed are at the greatest risk of dropping out, especially those identified as having learning disabilities or hearing, speech, or health impairments.

One repercussion of the move toward integration, especially at the secondary school level, appears to be the relative absence of support and monitoring that may serve as an important deterrent to dropping out. As we move to normalize the educational and social opportunities of students with handicaps, we may also lose an inordinate number of them in the process. Unfortunately, it has become a normal occurrence in our high schools to lose one out of every four students, and the evidence appears to indicate that the number is even higher for those identified as having handicaps. It may be necessary to reevaluate the effectiveness of IEPs (and the planning process), and the degree to which they provide the individualized attention that was originally intended. The early introduction of goals, objectives, and student outcomes that foster the process of transition from school to work, combined with methods of student retention, appear justifiable and long overdue.

Although past research has been concerned largely with the causes and correlates of dropping out, Wehlage and Rutter (1986) argue that the focus of new research should be directed toward studying the "institutional character of school and how this affects the potential dropout" (p. 376). It may be reasonable to assume that these characteristics, such as policies and practices that affect schools' holding power, have some relationship to the quality of special services offered to youth with handicaps, since they both exhibit high risk characteristics.

Implications for Transition

From the perspective of employment, there are ample data available from studies using HSB that indicate limited education and unemployment are likely outcomes for many young people with mild handicaps, and especially for those who drop out of school. This, together with considerable evidence in the literature, suggests that these youth will not make any major gains in the labor market unless there is a concerted effort to identify and introduce programs that will enhance the employment prospects of young people (National Association of Rehabilitation Facilities, 1986; Novak & Dougherty, 1979).

The meaning of handicap, as operationally defined in HSB, represents several distinctly different subgroups, each with their own unique characteristics. For example, the unemployment and "not in the labor force" rates of young people with learning disabilities (10.5% and 41.6%, respectively) far exceed the unemployment and "not in the labor force" rates of individuals with orthopedic handicaps (4.7% and 35.2%, respectively). In addition, only 19% of young adults with learning disabilities go on to either part- or full-time postsecondary education. These are only two dimensions on which individuals with various handicaps differ on critical transition variables, and a vivid example of how certain young adults with specific handicaps appear to be more prone to a variety of hardships in contrast to those with other specific handicaps. What may be inferred from these results is that many more persons with specific handicaps, and differing graduation status, could be working or attending postsecondary educational institutions than are doing so currently.

In order to provide for greater employment options and to enhance the enrollment in postsecondary education, there must be a commitment to supporting these goals. Service delivery systems that focus on employment and further education must be expanded for young adults who have mild handicaps. In addition, teachers, counselors, and other professionals must be trained to provide direct transition-related services, along with changes within schools that allow for flexible options and alternatives that include greater community and outside agency involvement. The prevailing opinion is that proposed curriculum changes, and some already in effect, will prepare students with disabilities to meet criteria for finishing

school. However, these changes do not incorporate goals related to employment or adult functioning after leaving school (Wilcox & Bellamy, 1981).

Another Look at Transition Models

Models that have been proposed to examine the transition process assume that individuals with handicaps will graduate, or at least receive some support as part of their individualized secondary-level educational program (Halpern, 1985; Will, 1984). This assumption needs to be reevaluated in light of the higher-than-expected attrition rates documented by the findings of this study and various other studies in recent years (Edgar, Levine, & Maddox, 1985; Harnisch, Lichtenstein, & Langford, 1986; Hasazi et al., 1985; Hippolitus, 1980; Levin, Zigmond, & Birch, 1985; Plisko & Stern, 1985).

The conceptualization of transition as a bridge, suggested by McDonnell, Wilcox, and Boles (1983) and Will (1984), is particularly poignant in view of the disruptive effects of dropping out:

> Like a bridge, transition is only as strong as the foundation on either side (the quality of school preparation on one side and the quality of adult service opportunities on the other) and the construction of the span itself (the planning process). If any of these components are inadequate, the chance of the student success in the community is greatly reduced. (McDonnell, Wilcox, & Boles, 1983, p.2)

The degree to which young people rely on schools to aid in the transition phase of their development is seriously curtailed under such abrupt termination. Thus, the dependability of schools in providing some form of stability in the transition process is seriously in question for thousands of individuals nationwide. A modified transition model which includes options and pathways for early school leavers should be considered. This modified transition model could potentially integrate school, community, and social networks to provide the best services for this segment of the population.

The widely cited transition model proposed by the Office of Special Education and Rehabilitative Services (OSERS) suggests three bridges emanating from high school. A brief

description of these pathways provides some indication of their shortcomings with regard to selected groups of young adults with handicaps.

The first bridge, labeled "transition without special services," refers to the use of generic services available to anyone in the community. Postsecondary education, such as community college, is mentioned as a prime example of this type of service (Halpern, 1985). For individuals who drop out, regardless of their handicap status, this route appears to be blocked by the lack of credentials and other barriers to admission. The likelihood of creating a permanent subculture of handicapped and disadvantaged individuals with handicaps who are unable to access educational services after high school (in spite of legislative mandates) appears probable. Presumably in view of these barriers, in the last few years, OSERS has issued a series of requests for proposals for postsecondary education programs for individuals with learning disabilities (Office of Special Education and Rehabilitative Services, 1984).

"Transition with time-limited services" refers to specialized, short-term services, where the presence of a disability is usually required in order to qualify a person for access to the service. Vocational rehabilitation is offered here as an example (Halpern, 1985). Here again, the use of formal agencies, regardless of handicap status, is generally avoided by those who have had unsuccessful involvement and an incomplete history with a primary agency (i.e., high school). One could reasonably speculate that there is little or no further communication between school personnel and adult service agencies once the student drops out (Steinberg, Blinde, & Chan, 1984). In addition, by their own admission, state vocational rehabilitation agencies serve only a fraction of the eligible persons between the ages of 16 and 24 years (National Association of Rehabilitation Facilities, 1986). The implication here is that there is a serious gap in services for many young adults who find it difficult to connect with work or further education.

Schools have been reluctant to extend their control and finances beyond traditional physical and grade-level boundaries. Additionally, rehabilitation agencies suffer from financial shortages and lack of know-how (Rusch, Mithaug, & Flexer, 1986). It is imperative that

some agency, or group representing agencies, determine responsibility and provide supplemental assistance in job placement, follow-up, or support in finding an appropriate postsecondary educational environment. Employment-related assistance could be accomplished locally through the Job Training Partnership Act agencies (JTPA), yet few initiatives occur without collaborative agreements and prior planning. Even with the option of using JTPA, Mann (1986) warns that it is simply not enough:

> To put an at-risk young person into a work-experience program or an on-the-job training situation there needs to be a link between learning and earning. There needs to be experience with both schooling and paid employment. Some of the success of JTPA program (see Youth Employment Demonstration Program and see Comprehensive Employment and Training Act) springs from the connection. (p. 318)

This option must be considered more seriously and incorporated into the agenda for transition improvement.

The third bridge has been labeled "transition with ongoing services." The supported-work model of competitive employment could be an example of this type of ongoing service since it is characterized by long-term follow-up training. However, Halpern (1985) argues that this bridge does not represent a widely existing service delivery system where the goal of transition is employment. Many of the federally funded demonstration projects can be classified under this category. Once again, this avenue appears an unlikely option for young adults with mild handicaps who are also early school leavers, since it is customarily reserved for individuals who have more severe handicaps and require intensive support services for unspecified periods of time. Few programs (except for a rare number of specially designed alternative school programs) currently exist that serve individuals with mild handicapping conditions.

In view of the findings, and the apparent inability of our service delivery structure to assist individuals with mild handicaps, increasing attention must be focused on the lack of appropriate options for such individuals in transition from high school to postsecondary education or work. According to Ianacone and Tilson (1983) and Wilcox and Bellamy (1981), this lack of closure on the transition process often stems from the schools' focus on academic

remediation and meeting graduation requirements rather than on providing marketable skills and securing employment.

Gould and Bellamy (1985) argue that transition is not just a problem of service delivery. There are less formal arrangements that involve graduating from school to an appropriate job as a result of employer connections established during the school's vocational training efforts, family and friendship support networks, and personal efforts. However, in many instances, high schools, as sending agencies, are unable to provide for a successful first step. This is most apparent for dropouts with handicaps. Maddox and Edgar (1984) suggest that the "hand-off" is the easiest element of the transition service to improve, provided that both sending and receiving agencies can agree on a process for exchanging information about clients. Unfortunately, the planners did not consider the most basic of options open to the individual who may be frustrated and in need of an immediate escape. By acting early, schools could, in collaboration with other agencies, provide continuity of services and conceivably decrease the high incidence of dropping out. Narrowly conceived options and few safeguards have created a fragmented system that allows for neglect and lack of follow-up of students who do not succeed by traditional standards.

In summary, it should come as no surprise that young workers generally lack skills and experience and therefore encounter difficulty in the labor market (Borus, 1982; Levin, 1983). The overall findings of this study suggest that respondents who have handicaps have only made moderate adjustments to the labor market. However, they are not a homogeneous group who have similar transition patterns. An examination of youth employment status demonstrates moderate variations in labor force participation rates, type of occupational involvement, hourly earnings, and hours worked per week.

A major strength of the results reported in this research is their basis in the most current nationally representative sample attainable. Regardless of the absence of key handicaps, such as mental retardation and emotional disorders, there are distinctly different patterns re-

ported in this investigation that support related studies on the varied success of transition experiences.

Notes

[1] According to the Center for Statistics, students who identified themselves as visually handicapped appear to be overrepresented in the sample, because of a general misinterpretation on the part of students, many of whom may have only had mild visual problems correctable by glasses or contact lenses. The Center for Statistics advises caution in the use of this category.

[2] For the purpose of conducting the discriminant function, the first job classification needed to be transformed into a series of four dummy-coded variables: (1) Professional and Managerial Occupations, (2) Subprofessional Occupations (clerical and sales), (3) Farm-related Occupations (farmers and farm labor), and (4) Skilled Manual Workers (craftsmen, operatives, and transportation operatives). The reference group consisted of those who were in service trades and jobs in private households.

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5

Development and Analysis of Independent Living Scales

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Reviewing the literature on independent living for people with handicaps, Harnisch, Chaplin, Fisher, and Tu (1986) found a lack of consistency among the definitions and the behavioral domains included in these studies. To facilitate their analysis of the literature, they proposed a definition that includes seven behavioral domains: (a) self-advocacy and maintenance skills; (b) living arrangements; (c) education, training, and employment; (d) mobility and transportation; (e) generic community services; (f) leisure and recreation; and (g) community integration.

This chapter reports the results of the analysis of independent living data on youth in transition. Specific behaviors and abilities that are necessary for independent living in this society were compared for youth with handicaps and those without. These comparisons

traced the development and use of scales representing domains of independent living and served to differentiate between groups.

These analyses were aimed at identifying items in an extant data set, and selecting those items that are applicable to the definition of independent living. Once this task was completed, the *High School and Beyond* (HSB) data set could be analyzed, using the identified items as measures of independent living abilities and skills.

Item Selection

Questions were chosen from the 1980, 1982, and 1984 samples of the *High School and Beyond* (HSB) National Longitudinal Survey (Center for Statistics, 1986). All survey forms were examined to find those items that seemed to match the domains of independent living. A total of 75 questions were selected. These questions represented 350 variables in the data set as numerous sections were embedded in the original questions. This initial screening was aimed at an over-inclusive approach, and a finer selection process used expert judges.

Expert Judges

Once the initial screening of items was completed, the sets of items were sent to 12 experts in special education, rehabilitation, and independent living. The judges were asked to indicate which of the seven domains of independent living each item represented, if it represented some other domain not mentioned in the definition, or if it did not represent an aspect of independent living at all. The judges were able to assign a question to more than one domain, because many questions had multiple parts. A description and an example of the procedure used in assigning the HSB questions to the seven independent living domains are given in Appendix D.

To be assigned to an independent living domain, a variable had to be placed there by the majority of the judges, with no higher number of assignments to any other domain. Those variables that were assigned to the "Not Applicable" category or that failed to receive the majority of the assignments to any specific category were dropped from further analysis. The variables for questions with multiple parts were individually evaluated and assigned to their appropriate independent living domains. The variable groupings constructed by this procedure were considered to have content validity as behavioral domains of independent living.

To determine the nature of these independent living domains, the variables of which they were composed were then factor analyzed. Factor analysis was not used for the generic services component because all the variables involved were categorical in nature. The mobility and transportation component had so few variables assigned to it that factor analysis was not feasible. Analyses of these two domains were conducted with the nonparametric procedures reported later in this chapter.

Factor Analysis

The variables from the five remaining domains were factor analyzed to develop scales within each component of independent living. An iterative principal factor solution was obtained using squared multiple correlations as the initial communality estimates. The number of factors specified in the factor models were based on common heuristics involving the scree test for derived eigenvalues (Harris, 1985). Oblique rotations of the resulting factor patterns were obtained using the promax method. All factor loadings discussed in this chapter will reflect resulting standardized regression coefficients.

The factor loadings were used as guidelines for selecting items for each scale. Items with factor loadings above .30 were considered viable choices for the scale representing that particular factor. If an item had loadings above .30 on more than one factor, it was assigned to the factor on which it had the highest loading. During the process of interpreting the factors,

items that were theoretically consistent with the bulk of the items loading on that factor were retained for the scale. Items with factor loadings less than .30 were occasionally included if they were theoretically relevant, and their loadings were close to the criterion for inclusion. Although these modifications to the acceptance criteria were essential in generating theoretically meaningful scales, they were used sparingly. Brief descriptions of the resulting factors are given below:

Self-Advocacy and Maintenance Skills

Factor I, Computer Skills. A high score is associated with experience with a variety of computer hardware and software packages, including statistical, business, word processing, and data base management packages.

Factor II, Resource Utilization. Questions assess skills necessary for gathering and using information, applying for jobs, and college admissions, etc.

Factor III, Technological Skills. A high score indicates experience in operating a variety of electronic equipment.

Factor IV, Life-Style Orientation. Questions assess the importance of various factors in living one's life.

Factor V, Academic Organization. Assesses the student's organization of class materials and his or her willingness to work hard in school.

Living Arrangements

Factor I, Financial Support. Scores reflect the amount of financial support (primarily in room and board) provided by the family.

Factor II, Household Composition. A high score indicates that the student did not live with his or her family.

Factor III, Tax Exemption. A high score indicates that the student was claimed as a tax exemption by parent(s).

Factor IV, Adult Milestones. Scores reflect the age at which the student expects to attain each of a number of adult milestones (e.g., getting the first job, finishing full-time education, or getting married). Low scores indicate attainment at younger ages.

Community Integration

Factor I, Group Participation. A high score indicates active participation or leadership in group activities.

Factor II, Social Roles. A high score reflects the student's belief that others see him or her as a positive role model with a number of favorable attributes.

Factor III, Social Activities. Items on this scale reflect how often the student engages in various forms of social interaction (e.g., talking to friends on the phone, dating, and just driving around).

Factor IV, Church Participation. Scores reflect the level of attendance at church services and involvement in associated activities.

Leisure and Recreation

Factor I, Extracurricular Clubs. Scores reflect the level of involvement in extracurricular clubs and activities.

Factor II, Extracurricular Sports. Scores reflect the level of involvement in athletic teams.

Education, Training, and Employment

Factor I, Work Experience A high score indicates that the student has held a job for pay and acquired work experience.

Factor II, Career Expectations. This is primarily associated with plans for, and behavior during, the year after leaving high school. High scores are associated with postsecondary education, whereas low scores reflect getting a job or becoming a homemaker.

Factor III, Postsecondary Education. This scale represents the type of postsecondary education being sought. High scores indicate planning for, and enrolling in, a four-year college. Low scores are associated with vocational training. Scores in the middle of the range are associated with youth not seeking postsecondary education.

Factor IV, Awareness of Special Programs. Scores reflect the level of awareness of, and participation in, special high school programs.

Appendix E contains a summary of the questions and response alternatives, as well as their HSB variable names. The obtained factor loadings are listed for the original variables. Variables that were recoded to reverse their scoring have an "R" placed before their HSB variable names. Appendix F describes a number of the measures used in this study and how they were developed from the HSB data set.

Scale Construction

When constructing the scales, the selected variables were standardized ($M = 0.0$, $SD = 1.0$) to avoid unequal weighting due to the differences in item variances. Variables not scored in the desired direction were rescaled by multiplying the standardized values by -1.0. Given that each variable was standardized to have a mean of zero, multiplying a variable by -1.0 caused the values of the variable to pivot around its mean: that is, values above the mean (i.e., positive values) were rescaled to be below the mean (i.e., negative values), and vice versa. When all of the variables were scaled in the appropriate direction, missing values on each variable were replaced by the standardized mean value of zero.

Scale scores were calculated, after standardization and necessary rescaling, by summing the item values and dividing by the number of items: that is, scale scores reflect the mean of their respective item scores. Each of the derived scale scores were then standardized to a mean of 50 and a standard deviation of 10. Scales were scored in the direction of independent living (i.e., higher scores should reflect higher degrees of independent living). The exceptions to this involved scales that: (a) were easier to interpret if scored in the opposite direction, or (b) assessed a dimension for which extreme either scores above or below the mean could be associated with higher levels of independent living. For the sake of clarity, each of the exceptions is illustrated below.

In the living arrangements component, scores on the financial support and the tax exemption scales (factors I and III) are easier to interpret when the scale values reflect the

amount of support provided by the parents. Hence, higher scores on these scales are associated with lower levels of independent living. The adult milestones scale (factor IV of the living arrangements component) is interesting in that lower scores are associated with reaching adult milestones at earlier ages. Although this finding could be viewed as a sign of greater independence, this is often achieved by foregoing postsecondary, and perhaps even some secondary education. This can reduce the range of employment opportunities and potential earning power for those who reach the milestones at a very early age. Similarly, in the education and training component, the career expectations scale (factor II) contrasts youth who seek postsecondary education with: those who seek jobs. The postsecondary education scale (factor III) contrasts youth who seek four-year college degrees with those who seek vocational training. It could be hypothesized that extreme scores (either above or below the mean) could be associated with higher levels of independent living. These hypotheses will be tested in analyses for future reports.

Reliability

Reliability analyses were conducted for each of the derived scales. Table 5.1 contains median item-total correlations, Cronbach's Alpha for standardized variables[1] and an expected reliability index (based on the Spearman-Brown prophecy formula). Because Cronbach's Alpha is affected by the number of items in the scales, the Spearman-Brown prophecy formula was used to predict the reliability of each scale had the scale contained 40 items.

The median item-total (scale) correlations for the scales ranged from .31 to .84, with a median of .47. The obtained values for Cronbach's Alpha ranged from .63 to .92, with a median of .72. Although these values may seem low in some cases, it should be noted that the average length of the scales was approximately six items. The expected reliability of the scales is much higher when using the Spearman-Brown prophecy formula to estimate the reliability of the scales based on a common length of 40 items. The resulting estimates ranged between .89 and .99, with a median of .95.

Table 5.1. Reliability Measures for the Components and Derived Scales of Independent Living

Scale / Factor	Number of items	Median item-total correlation	Cronbach's Alpha	Expected reliability
Self-advocacy	31	.23	.76	.80
I Computer skills	8	.47	.80	.95
II Resource utilization	6	.44	.71	.94
III Technological skills	4	.56	.76	.97
IV Life-style orientation	9	.34	.64	.89
V Academic organization	4	.50	.65	.95
Living arrangements	27	.29	.78	.84
I Financial support	10	.66	.90	.97
II Household composition	8	.59	.86	.97
III Tax exemption	4	.84	.92	.99
IV Adult milestones	5	.55	.78	.97
Community integration	21	.13	.53	.68
I Group participation	7	.54	.78	.95
II Social roles	6	.48	.73	.95
III Social activities	5	.37	.64	.94
IV Church participation	3	.42	.63	.96
Leisure and recreation	13	.27	.65	.85
I Extracurricular clubs	10	.31	.66	.89
II Extracurricular sports	3	.46	.66	.96
Education and training	29	.26	.71	.77
I Work experience	8	.71	.90	.98
II Career expectations	11	.44	.72	.91
III Postsecondary education	5	.38	.64	.93
IV Special programs	5	.37	.64	.93

Note: Median item-total correlations are based on corrected item-total correlations. Expected reliability is based on the Spearman-Brown prophecy formula for a common scale length of 40 items.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores.

Based on the item-total (scale) correlations and the reliability coefficients, it seems that dividing the components of independent living into the derived scales provides more specific information with higher levels of internal consistency. For example, the education and training

component of independent living has four derived scales, each of which addresses a specific aspect of the component. A component score can be obtained by collapsing across the scales it comprises. When evaluating the reliability of each of the five components, the item-total (component) correlations ranged from .13 to .29, with a median of .26. The obtained Cronbach's Alpha coefficients ranged from .53 to .78, with a median of .71, and the estimated reliability coefficients based on a common length of 40 items ranged from .68 to .85, with a median of .80. When the unit of analysis is the component as a whole, rather than the scales, the values of the reliability measures are lower. This finding indicates that each component of independent living is multidimensional. We anticipate that the derived scales within each of the components will contribute to detailed and reliable profiles of youth in transition.

Results

The scores on the derived scales of independent living were used as the basis for four sets of comparisons. First, the scores of youth with handicaps were compared to those of youth without handicaps. For more complete patterns of differences, the analyses then focused on the effects of two variables that could interact with handicap status: high school graduation status (dropout/graduate) and sex (male/female). Although these latter two sets of analyses provided more specific information, they could not be used to make distinctions based on the specific type of impairments or disabilities involved. In the final set of comparisons, the data were broken down by specific handicapping conditions. Youth with a particular handicap were compared to youth with other handicaps, rather than to youth without handicaps. Because the scale scores were standardized ($M = 50.0$, $SD = 10.0$) on the total sample, it was possible to compare the mean scores from a particular handicapping condition to the mean scores of the sample as a whole (i.e., youth with and without handicaps combined). The symbol *"D"* is used to denote the *absolute difference* between the means of the comparison group.

Handicapped Versus Nonhandicapped Youth

Self-advocacy and maintenance skills. When comparing the independent living outcomes for youth with handicaps and those without, differences become apparent on several of the scales. In the self-advocacy domain, youth with handicaps were seen to be at a disadvantage. As is shown in Table 5.2, nonhandicapped youth tended to utilize resources better ($D = 1.01$), have more technological skills ($D = 1.65$), have life-style orientations reflecting a greater importance placed on success ($D = 1.77$), and have better academic organization ($D = 1.91$). Box plots of the scale comparisons are presented in Figure 5.1.

Living arrangements. In the living arrangements component, youth with handicaps reached or expected to reach adult milestones (e.g., finishing education, getting a job, getting married) at younger ages than did nonhandicapped youth ($D = 1.64$). While attaining these milestones at a young age may reflect higher levels of independence, this early achievement is frequently associated with lower levels of education, employment, and income. This pattern can be seen in the differences obtained in the education and training component (see Figure 5.2).

Education, training, and employment. Nonhandicapped youth tended to have higher scores than youth with handicaps on the career expectations and postsecondary education scales ($D = 2.46$ and $D = 1.05$, respectively). The scores on the career expectations scale suggest that nonhandicapped youth are more likely to attend postsecondary education, while youth with handicaps tend to seek jobs immediately after leaving high school. Of the youth seeking postsecondary education, those with handicaps tended to seek vocational training rather than studying at a four-year college. As a result, youth with handicaps complete their full-time education and obtain regular jobs (two of the milestones) at younger ages than do nonhandicapped youth.

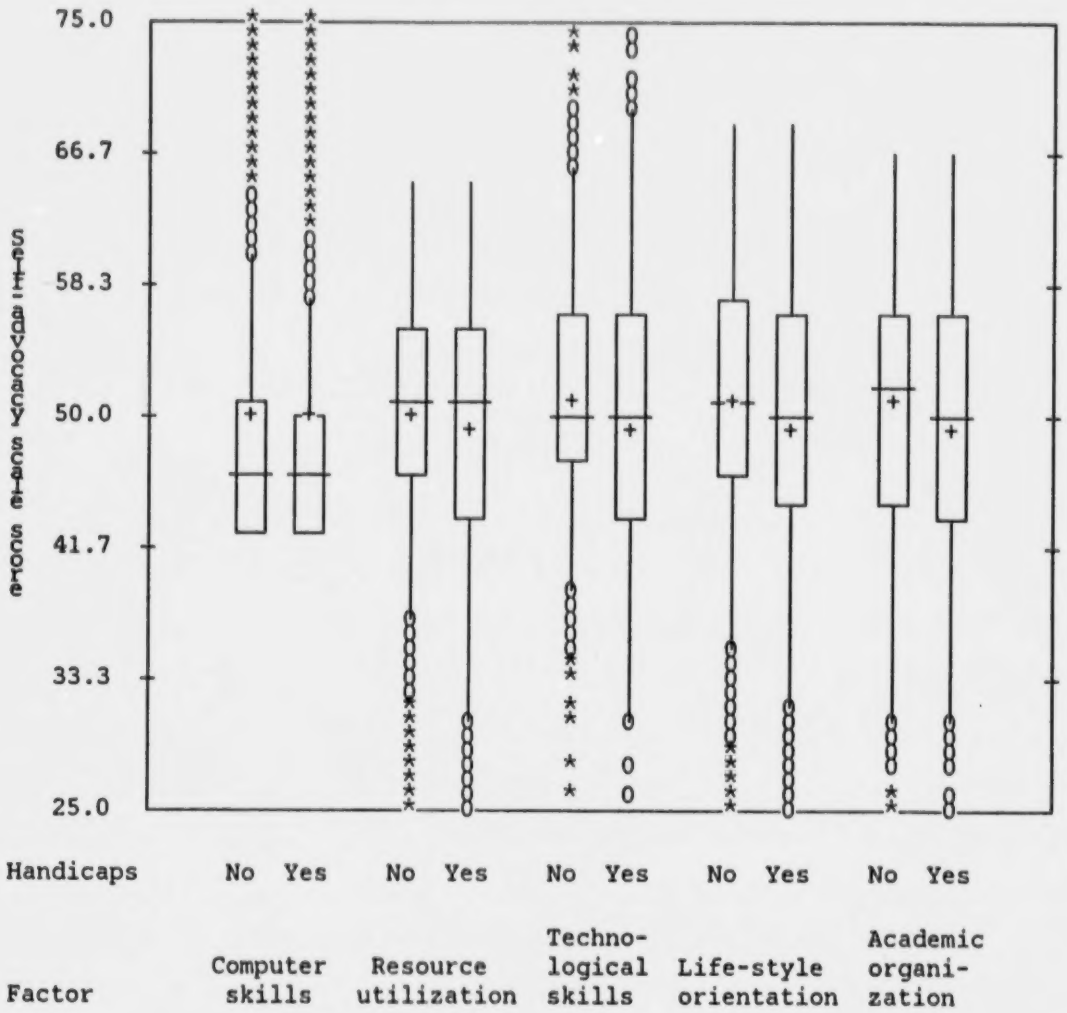
Also in the education and training component, students with handicaps had slightly higher scale scores than youth without handicaps did on involvement in special programs ($D = 1.28$). This is not surprising, because these programs were usually targeted at such

Table 5.2. Independent Living Scale Means and Standard Deviations by Handicap Status

Scale / Factor	Without handicaps (N = 10,232) M	SD	With handicaps (N = 4,469) M	SD
Self-advocacy				
Computer skills	50.18	10.04	49.59	10.02
Resource utilization	50.31	9.75	49.30	10.65
Technological skills	50.50	9.62	48.85	10.82
Life-style orientation	50.54	9.34	48.77	11.40
Academic organization	50.58	9.60	48.67	10.88
Living arrangements				
Financial support	50.27	9.71	49.43	10.63
Household composition	50.14	10.30	49.67	9.38
Tax exemption	50.08	10.33	49.82	9.33
Adult milestones	50.50	9.85	48.86	10.38
Community integration				
Group participation	49.95	9.96	50.12	10.23
Social roles	49.85	9.91	50.34	10.33
Social activities	49.98	9.95	50.06	10.26
Church participation	49.95	10.03	50.12	10.08
Leisure and recreation				
Extracurricular clubs	49.93	9.97	50.16	10.21
Extracurricular sports	50.01	10.09	49.98	9.94
Education and training				
Work experience	49.76	10.12	50.56	9.85
Career expectations	50.75	9.92	48.29	10.11
Postsecondary education	50.32	10.25	49.27	9.51
Special programs	49.61	9.55	50.89	11.04

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

Figure 5.1. Self-Advocacy and Maintenance Skills Scales by Handicap Status

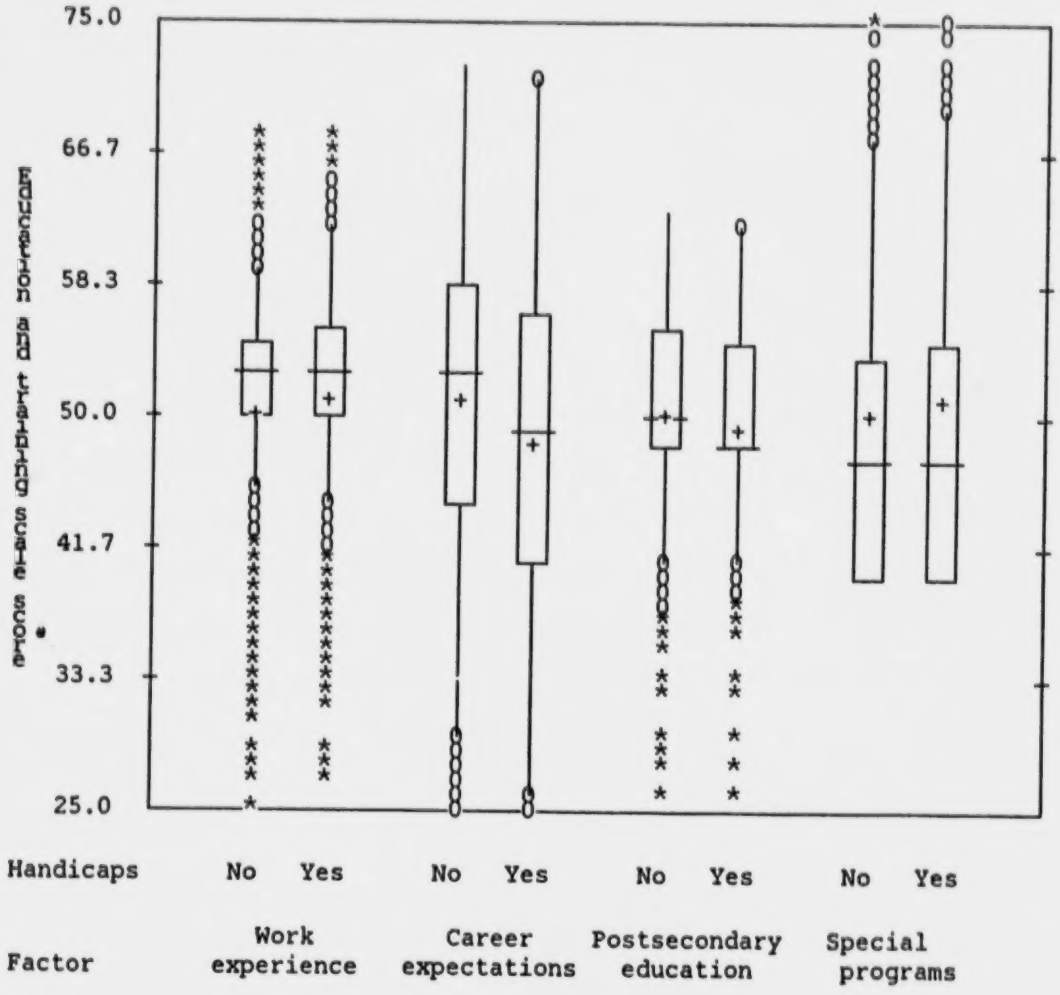


Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

youth in attempts to enhance their educational experiences and to promote their abilities to enter the competitive workforce.

Community integration and leisure and recreation. No notable differences were observed between the two groups on the community integration or the leisure and recreation components of independent living.

Figure 5.2. Education and Training Scales by Handicap Status



Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

To summarize Table 5.2, nonhandicapped youth scored more than a tenth of a standard deviation higher than did those with handicaps on four of the five self-advocacy scales, which clearly indicates higher levels of independent living on this particular component. The interpretation of the other differences discussed is not as clear.

Youth with handicaps expected to reach adult milestones at younger ages than nonhandicapped peers. This difference can be related to the differences found on the career expectations and postsecondary education scales. The scores on these two scales seem to reflect the greater tendency for youth with handicaps to seek jobs or a two-year vocational training program rather than a four-year college education after leaving high school. Hence, although youth with handicaps tend to reach certain adult milestones sooner than nonhandicapped youth, they often do so at the cost of higher education.

Finally, the scores on the special programs scale were higher for youth with handicaps than they were for youth without handicaps. The special programs seem to be targeted for youth whom are disadvantaged in some way, which is consistent with the finding that scores on this scale are negatively related to GPA, test scores, and socioeconomic status. However, scores on this scale are positively related to many of the other scales of independent living; the strongest of these correlations is with the resource utilization scale ($r = .13$), which may be an indication of the positive outcomes resulting from participation in such programs.

Graduation Status

Self-advocacy and maintenance skills. Table 5.3 gives the means and standard deviations for youth with and without handicaps broken down by high school graduation status (dropout/graduate). As is seen in the table, nonhandicapped youth tended to have higher self-advocacy scale scores than youth with handicaps. This finding was moderated slightly by graduation status. The differences between youth with and without handicaps were greater among dropouts on the technological skills scale (dropouts, $D = 1.71$; graduates, $D = 1.27$), the life-style orientation scale (dropouts, $D = 1.92$; graduates, $D = 1.53$), and the academic organization scale (dropouts, $D = 1.87$; graduate, $D = 1.58$) (see Figure 5.3).

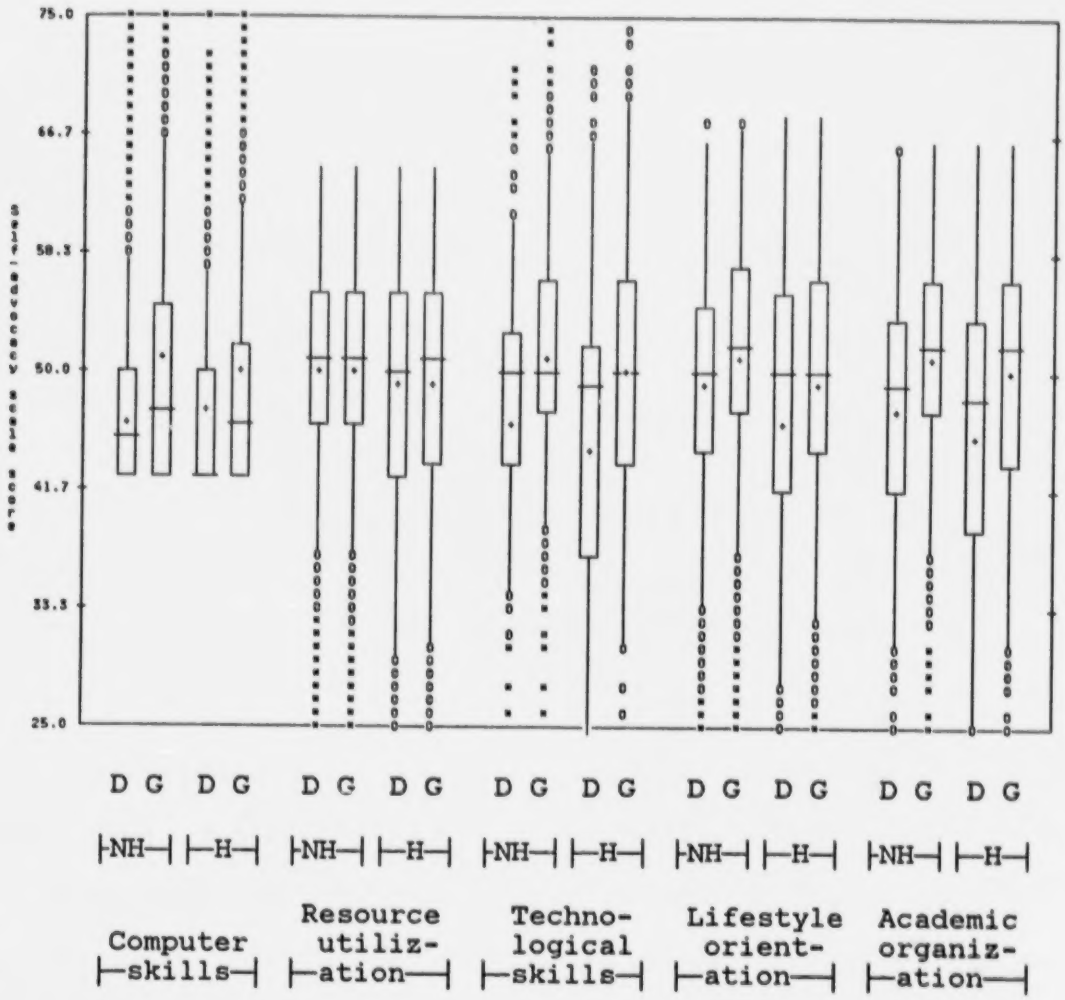
The interaction between graduation status and handicapping status was more pronounced when one compares the scores on the resource utilization scale. On this scale, nonhandicapped dropouts scored noticeably higher than the dropouts with handicaps

Table 5.3. Independent Living Scale Means and Standard Deviations by Handicap and Graduation Status

	Drop out				Graduate			
	Without handicaps (N = 1,807)		With handicaps (N = 1,063)		Without handicaps (N = 8,296)		With handicaps (N = 3,338)	
Scale / Factor	M	SD	M	SD	M	SD	M	SD
Self-advocacy								
Computer skills	46.69	6.77	46.90	7.53	50.95	10.54	50.44	10.64
Resource utilization	50.44	10.20	48.86	11.08	50.25	9.68	49.41	10.51
Technological skills	46.60	10.85	44.89	12.02	51.35	9.18	50.08	10.21
Life-style orientation	48.67	10.17	46.75	12.81	50.96	9.10	49.43	10.80
Academic organization	47.21	10.51	45.34	11.80	51.35	9.20	49.77	10.37
Living arrangements								
Financial support	47.79	11.28	47.67	11.41	50.81	9.32	49.97	10.42
Household composition	50.82	6.81	50.65	6.83	50.00	10.98	49.36	10.12
Tax exemption	48.84	5.78	48.80	5.86	50.36	11.12	50.14	10.26
Adult milestones	43.45	9.51	44.03	10.13	52.04	9.28	50.40	9.99
Community integration								
Group participation	47.53	8.19	48.10	8.59	50.48	10.26	50.75	10.62
Social roles	52.32	9.92	51.07	10.63	49.33	9.86	50.10	10.21
Social activities	53.63	9.74	52.69	10.07	49.17	9.81	49.24	10.17
Church participation	47.71	7.33	48.43	7.56	50.46	10.49	50.69	10.71
Leisure and recreation								
Extracurricular clubs	49.30	4.81	49.79	6.04	50.07	10.80	50.29	11.21
Extracurricular sports	48.64	5.08	49.05	5.54	50.28	10.86	50.32	10.99
Education and training								
Work experience	51.34	9.34	51.90	9.23	49.39	10.27	50.16	9.97
Career expectations	42.31	8.35	42.05	8.20	52.60	9.33	50.28	9.91
Postsecondary education	47.18	8.30	46.76	7.61	50.97	10.54	50.10	9.90
Special programs	50.72	10.35	52.35	11.95	49.36	9.36	50.38	10.66

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

Figure 5.3. Self-Advocacy and Maintenance Skills Scales by Handicap and Graduation Status



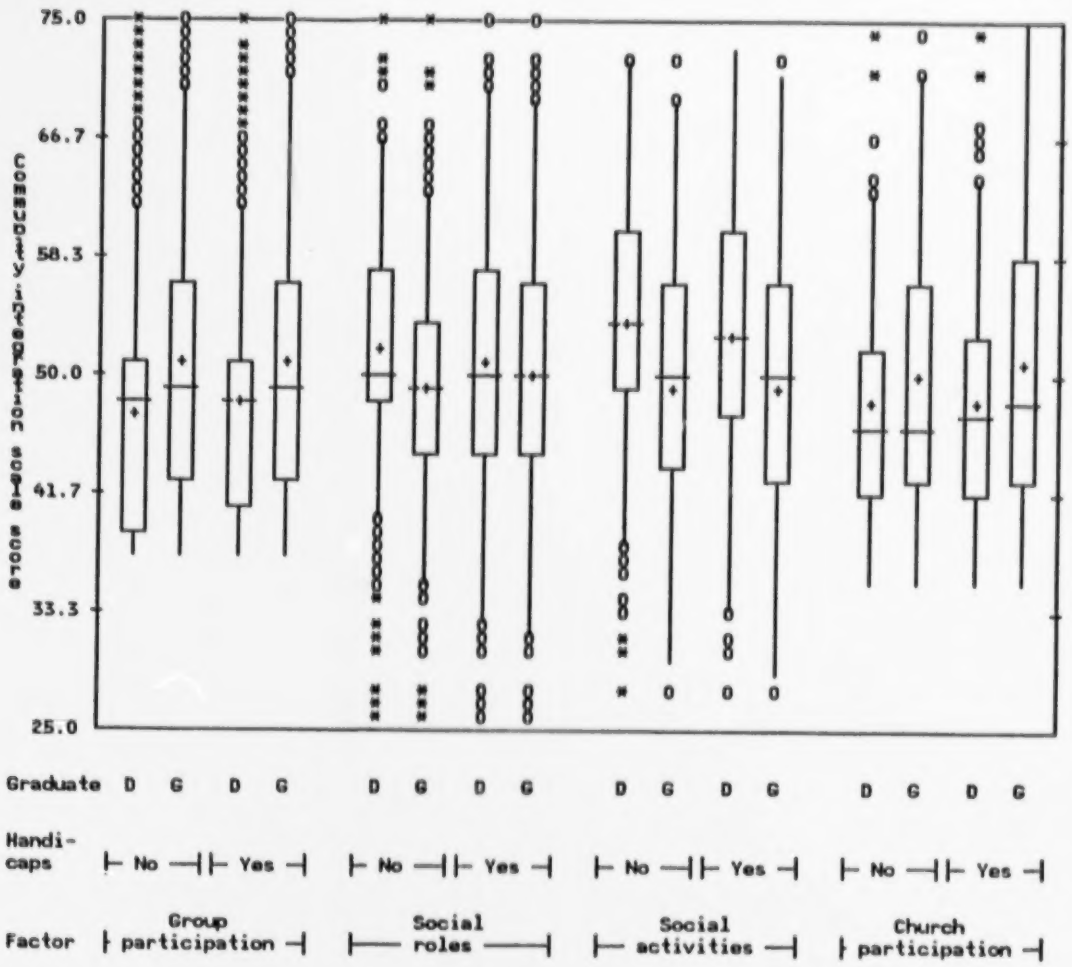
Note: D = Dropout, G = Graduate, NH = No handicaps, H = Handicaps.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

(D = 1.58), where as the difference between the two groups of graduates was not appreciably large (D = 0.84).

Living arrangements. In the living arrangements component of independent living, graduation status again provided a useful distinction between groups. Graduates with hand-

Figure 5.4. Community Integration Scales by Handicap and Graduate Status


75.0
66.7
58.3
50.0
41.7
33.3
25.0
Graduate D G D G D G D G D G D G D G D G
Handi-caps No Yes No Yes No Yes No Yes
Factor Group participation Social roles Social activities Church participation

Note: D = Dropout, G = Graduate.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

icaps expected to reach adult milestones at younger ages than did nonhandicapped graduates (D = 1.64). Although the observed difference among dropouts was rather small (D = 0.58), it must be noted that it was in the opposite direction: that is, dropouts with handicaps expected to reach the adult milestones at older ages than the nonhandicapped dropouts. The scale means for both dropout groups were extremely low (without handicaps, M = 43.45; with

handicaps, $M = 44.03$). The lower scores indicate reaching the milestones at younger ages and could, therefore, be interpreted as a reflection of greater independence. However, the potential long-term ramifications of reaching these milestones at the expense of a completed high school education could be quite serious.

Community integration. In the community integration component, an interesting interaction was obtained in the scores on the social roles scale. Among dropouts, the scores of youth with handicaps were higher than those of youth without handicaps ($D = 1.25$). The reverse was true among those who were graduated ($D = 0.77$) (see Figure 5.4). Responses to these questions are probably as much an indication of the individual's self-concept as they are a reflection of how others actually view him or her.

Examining the means of the four possible conditions (nonhandicapped dropouts, $M = 47.68$; nonhandicapped graduates, $M = 50.67$; dropouts with handicaps, $M = 48.93$; graduates with handicaps, $M = 49.90$), the obtained interaction between handicapped status and graduation status indicates that youth with handicaps tend to have more moderate scores. Compared to the nonhandicapped youth, their scores are not as high in the graduate condition, or as low in the dropout condition. This is not to imply that the scores for youth with handicaps are not affected by graduation status; the pattern suggests that graduation status does have an effect on scale scores for youth with handicaps ($D = 0.97$). However, this effect is much more pronounced among the nonhandicapped youth ($D = 2.99$). This is open to a number of interpretations, and it seems to point to a fruitful area for research, assessing how youth with handicaps cope with "failure" situations (e.g., dropping out) and how such "failures" affect their sense of acceptance in the community.

Education, training, and employment. As one would expect, graduation status provides a useful distinction in the education and training component. Scale scores reflecting career expectations showed a rather large difference between graduates with and without handicaps ($D = 2.32$), the former group having much higher scores. This finding suggests that youth with handicaps are more likely to seek jobs during the year after graduation, while nonhand-

icapped youth have a stronger tendency to pursue postsecondary education. There was virtually no difference in the scale scores among the dropouts (D = 0.26). As expected, the scores for dropouts were extremely low (nonhandicapped dropouts, M = 42.31, dropouts with handicaps, M = 42.05), indicating a strong tendency to seek jobs rather than pursuing postsecondary education during the year after leaving high school.

With respect to the levels of involvement in special programs, youth with handicaps were more involved than nonhandicapped youth, regardless of graduation status. These differences were larger among tne dropouts (D = 1.63) than they were among the graduates (D = 1.02). The highest involvement was on the part of the dropouts with handicaps (M = 52.35), while the nonhandicapped graduates had the lowest amount of involvement (M = 49.36), which seems to demonstrate that those students targeted for such programs have a much greater awareness of and involvement in them.

To summarize Table 5.3, most of the differences between youth with and without handicaps that were noted in Table 5.2 were repeated here with minor variations based on graduation status. The differences between youth with and without handicaps tended to be slightly more pronounced among the dropouts. While the above differences were rather small, three scales revealed a more a pronounced interaction between graduation status and handicap status: adult milestones, social roles, and career expectations. Scores for nonhandicapped youth seem to be affected by graduation status to a much larger extent: that is, although there are large differences between scores for dropouts and graduates regardless of handicap status, the tendency among nonhandicapped youth is to have more extreme highs and lows. Career expectations (i.e., job versus postsecondary education) and adult milestones scales seem to be related. The interpretation of these scales is fairly straightforward. More intriguing is the pattern found on the social roles scale. It seems that youth with handicaps and nonhandicapped youth are differentially affected by graduation status.

Sex Differences

As was noted earlier, the use of categorization schemes that cut across the handicap status dimension could provide a clearer picture of the differences between youth with disabilities and youth without disabilities. In that vein, we considered the possibility of sex differences in the data (see Table 5.4).

Self-advocacy and maintenance skills. Within the self-advocacy component, the pattern obtained for the resource utilization scale suggests that nonhandicapped males are slightly better than the other groups in making use of available resources (nonhandicapped males, $M = 50.73$; nonhandicapped females, $M = 49.92$; males with handicaps, $M = 49.37$; females with handicaps, $M = 49.22$). Average scores on the technological skills scale indicated that nonhandicapped youth had more experience with electronic equipment than did youth with handicaps (males, $D = 1.43$; females, $D = 1.83$). Scores on the life-style orientation scale indicate that nonhandicapped youth tend to place more importance on being generally successful in life than do youth with handicaps. Although the scores for males and females are virtually identical among nonhandicapped youth, they differ among youth with handicaps (nonhandicapped males, $M = 50.51$; nonhandicapped females, $M = 50.56$; males with handicaps, $M = 48.39$; females with handicaps, $M = 49.22$). Notably, the males with handicaps have the lowest average score. The final scale in this component, academic organization, reflects an additive relation between handicap status and sex. Females were more organized than males, and nonhandicapped youth were more organized than youth with handicaps (nonhandicapped males, $M = 48.78$; nonhandicapped females, $M = 52.21$; males with handicaps, $M = 47.19$; females with handicaps, $M = 50.40$).

Living arrangements. In the living arrangements component, nonhandicapped females received more financial support than did females with handicaps ($D = 1.13$). The scores on the adult milestone scale indicated that females, in general, expected to reach milestones earlier than their male counterparts, and that youth with handicaps expected to reach the milestones earlier than nonhandicapped youth (nonhandicapped males, $M = 51.64$; non-

Table 5.4. Independent Living Scale Means and Standard Deviations by Handicap Status and Sex

	Male				Female			
	Without handicaps (N = 4,870)		With handicaps (N = 2,406)		Without handicaps (N = 5,362)		With handicaps (N = 2,063)	
Scale / Factor	M	SD	M	SD	M	SD	M	SD
Self-advocacy								
Computer skills	50.29	10.36	49.76	10.27	50.09	9.75	49.40	9.72
Resource utilization	50.73	9.91	49.37	10.85	49.92	9.60	49.22	10.41
Technological skills	50.25	9.97	48.82	11.10	50.72	9.28	48.89	10.49
Life-style orientation	50.51	9.89	48.39	12.60	50.56	8.82	49.22	9.79
Academic organization	48.78	9.80	47.19	11.00	52.21	9.11	50.40	10.48
Living arrangements								
Financial support	50.16	9.51	49.60	9.89	50.36	9.88	49.23	11.44
Household composition	50.35	10.33	49.39	9.43	49.95	10.27	50.01	9.30
Tax exemption	49.93	10.09	49.48	9.52	50.22	10.54	50.22	9.10
Adult milestones	51.64	9.91	50.18	10.68	49.46	9.69	47.32	9.80
Community integration								
Group participation	49.42	9.81	49.52	10.08	50.43	10.07	50.82	10.36
Social roles	49.86	9.93	50.20	10.45	49.85	9.90	50.50	10.19
Social activities	49.47	9.92	49.59	10.20	50.44	9.96	50.60	10.30
Church activities	48.86	9.56	48.99	9.54	50.94	10.34	51.43	10.52
Leisure and recreation								
Extracurricular clubs	46.96	7.93	47.95	9.02	52.63	10.82	52.74	10.90
Extracurricular sports	52.58	10.30	52.09	10.22	47.68	9.30	47.53	9.02
Education and training								
Work experience	51.15	8.77	51.89	8.56	48.49	11.05	49.00	10.96
Career expectations	51.61	8.87	49.37	9.08	49.98	10.72	47.03	11.06
Postsecondary education	49.94	9.81	48.93	9.17	50.66	10.63	49.67	9.87
Special programs	48.53	9.62	50.07	11.46	50.59	9.38	51.86	10.46

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

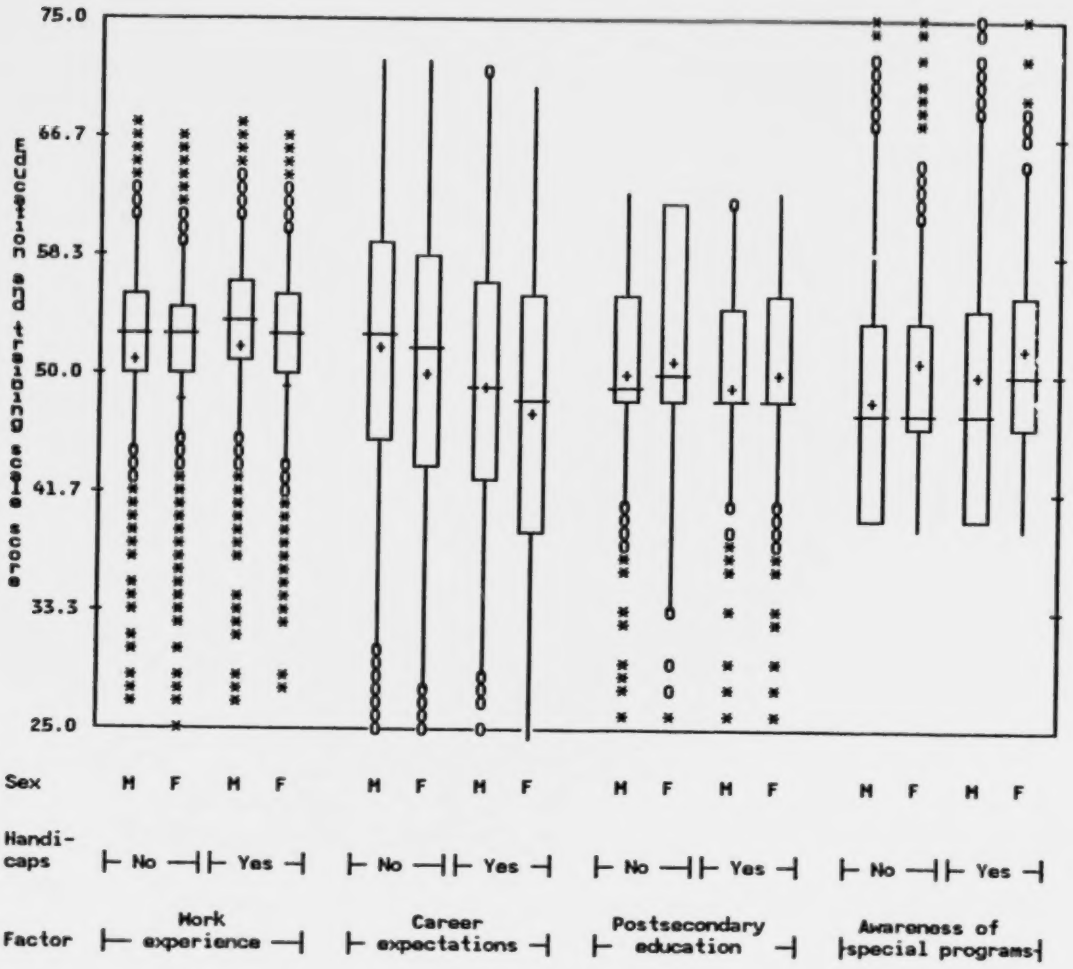
handicapped females, M = 49.46; males with handicaps, M = 50.18; females with handicaps, M = 47.32).

Leisure and recreation. In the leisure and recreation component, males with handicaps were slightly more involved in extracurricular clubs than were nonhandicapped males (D = 0.99).

Education, Training, and Employment. Finally, differences between youth with and without handicaps were obtained on several of the education and training scales (see Figure 5.5). Sex differences were also found, and the two effects were combined additively. Regardless of handicapping status, males had higher scores than did females on the work experience and career expectations scales, but males had lower scores on the postsecondary education and special programs scales. Turning to the effects of handicap status, the nonhandicapped youth had higher career expectations scores than did youth with handicaps (males, D = 2.24; females, D = 2.95), which reflects a stronger orientation toward postsecondary education. Similarly, nonhandicapped youth had higher scores on the postsecondary education scale (males, D = 1.01; females, D = 0.99); this is associated with their apparent preference for four-year colleges rather than vocational training. And, again, youth with handicaps generally had more involvement with special programs (males, D = 1.54; females, D = 1.27).

In summary, Table 5.4 displays effects due to handicap status and sex. These factors do not seem to interact in any meaningful way: that is, the pattern of differences between youth with handicaps and those without handicaps is quite similar for males and females. Conversely, the pattern of differences between males and females does not vary with handicap status. The effects of these two factors seem to be additive.

Figure 5.5. Box Plots of Education and Training Scales by Handicap Status and Sex



Note: M = Male, F = Female.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

Specific Handicapping Conditions

In an attempt to better understand youth with handicaps, five different handicapping conditions are compared (Table 5.5). The conditions are: (a) learning disabilities, (b) hearing impairments, (c) speech disabilities, (d) orthopedic impairments, and (e) other health impairments. Within each component of independent living, these groups will be compared to each

Table 5.5. Independent Living Scale Means and Standard Deviations by Specific Handicapping Condition

Scale / Factor	Learning disabilities (N = 353)		Hearing Impairments (N = 439)		Speech disabilities (N = 253)		Orthopedic impairments (N = 209)		Other health impairments (N = 1,065)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Self-advocacy										
Computer skills	46.98	7.18	48.81	8.88	48.07	7.88	52.44	12.12	50.36	10.63
Resource utilization	46.14	11.62	48.05	10.61	47.96	11.09	51.69	9.71	50.12	10.44
Technological skills	45.98	11.89	48.97	10.70	46.21	11.85	52.22	8.75	49.69	10.60
Life-style orientation	47.14	11.46	46.18	13.33	47.52	11.65	50.76	9.49	49.68	10.24
Academic organization	46.88	11.23	46.27	11.86	48.17	11.12	49.20	10.30	49.54	10.74
Living arrangements										
Financial support	49.27	8.15	48.97	10.62	48.98	9.17	50.72	7.36	49.31	11.51
Household composition	49.05	7.73	50.37	9.19	49.59	9.32	50.15	10.31	49.70	9.52
Tax exemption	49.85	7.18	50.06	8.13	49.33	9.12	51.44	10.06	49.39	9.98
Adult milestones	47.09	10.17	47.13	11.21	48.66	10.57	50.93	11.00	49.27	10.15
Community integration										
Group participation	47.99	8.39	50.43	9.94	48.50	9.77	51.65	10.89	51.09	10.62
Social roles	52.23	10.03	50.73	10.63	50.31	11.47	50.54	10.24	50.16	10.64
Social activities	50.07	9.86	50.50	10.59	47.64	9.61	49.87	10.23	50.54	10.59
Church participation	48.54	8.43	49.98	9.81	48.76	9.75	52.46	11.61	50.56	10.33
Leisure and recreation										
Extracurricular clubs	47.73	7.55	50.89	10.99	49.50	10.83	51.52	10.48	50.66	10.53
Extracurricular sports	49.15	8.64	51.02	9.93	50.19	10.01	48.87	9.36	49.56	9.88
Education and training										
Work experience	50.52	9.70	51.87	8.87	50.46	9.78	51.49	8.33	50.66	9.94
Career expectations	44.57	8.91	46.59	10.13	47.19	10.23	52.40	9.29	49.06	9.99
Postsecondary education	47.35	7.08	48.11	9.21	49.71	8.63	50.58	10.20	49.62	10.02
Special programs	50.93	11.05	51.08	12.35	50.92	11.11	51.55	11.45	50.89	10.79

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

other and to the total sample in an attempt to identify the strengths and weaknesses associated with specific impairments and disabilities.

Self-advocacy and maintenance skills. Within the self-advocacy component of independent living, youth with learning disabilities tended to have extremely low scores. In fact, of the five groups examined, youth with learning disabilities had the lowest average scores on scales assessing computer skills (M = 46.98), resource utilization (M = 46.14), and technological skills (M = 45.98). Their scores on the remaining two scales, life-style orientation (M = 47.14) and academic organization (M = 46.88), were lower than those for all other handicapping conditions except for youth with hearing impairments (M = 46.18 and M = 46.27, respectively).

Youth with hearing impairments scored poorly on the other self-advocacy scales as well. Although the averages of youth with hearing impairments were several points higher than those of the youth with learning disabilities, their means were still well below the means for the full sample on scales assessing computer skills (M = 48.81), resource utilization (M = 48.05), and technological skills (M = 48.97).

Youth with speech disabilities tended to score better than youth with learning disabilities on all five scales in this component. They also had higher scores than did the youth with hearing impairments on scales reflecting life-style orientation (M = 47.52) and academic organization (M = 48.17). However, this group tended to have lower scores than those with hearing impairments on scales associated with computer skills (M = 48.07), resource utilization (M = 47.96), and technological skills (M = 46.21). All of the means for this group were substantially below the means for the total sample.

In sharp contrast to the above groups, youth with orthopedic impairments had average scores that were well above those of the total sample on scales assessing computer skills (M = 52.44) and technological skills (M = 52.22). The mean score for resource utilization was also notably above the overall mean (M = 51.69).

The means for youth with other health impairments were extremely close to those of the overall sample. On this scale, this group did not seem to differ from the overall sample in any meaningful way.

Living arrangements. On the scales in the living arrangements component, the mean scores for each of the handicapping conditions were, with few exceptions, close to the means for the overall sample. One of the exceptions was that youth with learning disabilities expected to reach adult milestones earlier than the overall population (M = 47.09). Youth with hearing impairments and youth with speech disabilities had similar expectations (M = 47.13 and M = 48.66, respectively). The latter two groups also reported receiving less financial support from their parents (M = 48.97 and M = 48.98, respectively). The mean scale scores for youth with orthopedic impairments were consistently above those for the overall sample, although the differences were typically small. A noticeable difference was youth with orthopedic impairments were more likely to be claimed as tax exemptions by their parents (M = 51.44).

Community integration. Examining the scales in the community integration component, the patterns of means varied considerably from group to group. Youth with learning disabilities had fairly low scores on the scales assessing group participation (M = 47.99), social roles (M = 47.7), and church participation (M = 48.54). The means for youth with hearing impairments were close to the means of the overall sample on all four scales. Youth with speech disabilities tended to score below the means for the overall sample on the group participation scale (M = 48.50), the social activities scale (M = 47.64), and the church participation scale (M = 48.76). Youth with orthopedic impairments had higher scores for group participation (M = 51.65) and church participation (M = 52.46) than did youth in the overall sample. Finally, youth with other health impairments participated in group activities with relatively high frequency (M = 51.09).

Leisure and recreation. In the leisure and recreation component, youth with learning disabilities were less likely to participate in extracurricular clubs than were other youth

(M = 47.73). Interestingly, youth with hearing impairments were more likely to engage in extracurricular sports than other youth (M = 51.02). Youth with orthopedic handicaps differed from the rest of the sample in that they were more likely to participate in extracurricular clubs (M = 51.52), but less likely to participate in extracurricular sports (M = 48.87). Youth with speech impairments and youth listed as having other health impairments tended to engage in clubs and sports activities with about the same frequency as the total sample.

Education, training, and employment. Some interesting patterns of scale means were obtained in the education and training component. As would be expected, youth with learning disabilities had extremely low scores on the career expectations scale (M = 44.57). Given the nature of the items in this scale, this low group suggests that these youth tend to seek jobs after leaving high school, rather than pursue some form of postsecondary education. Not surprisingly, youth with learning disabilities also had the lowest scores of any of the groups on the postsecondary education scale (M = 47.35), which suggests that these youth are more likely than the rest of the sample to pursue vocational training than a four-year college education.

Youth with hearing impairments report having more work experience than the rest of the sample (M = 51.87). These youth also have lower scores on the career expectations scale than the rest of the sample (M = 46.59). This is associated with a greater tendency to seek a job after high school rather than continue formal education. These youth scored below the overall mean, again, on the postsecondary education scale (M = 48.11), reflecting a preference for vocational training rather than a program at a four-year college. Youth with hearing impairments also tended to score above the overall mean on the scale assessing the level of involvement in special programs (M = 51.08).

Youth with speech disabilities differ from the overall sample with respect to career expectations scores (M = 47.19). While the mean score for this group was much lower than that of the overall sample, it was still higher than the means of the previous two groups (those with learning disabilities and those with hearing impairments). Once again, youth with

orthopedic impairments had scores that were not only above those of the other youth with impairments, they were consistently above the means for the sample as a whole. The differences were most notable on the scales assessing work experience (M = 51.49), career expectations (M = 52.40), and involvement in special programs (M = 51.55). Finally, the scores for youth with other health impairments were not notably different from the mean of the overall sample.

In summary, the scale scores for youth with learning disabilities tended to be extremely low. Of the 19 scales that were examined, 11 were more than .2 SD below the mean for the overall sample, and 5 were more than .3 SD below the mean. These youth also had the most extreme mean score (career expectations, M = 44.57). That score was more than .5 SD below the mean of the overall sample, reflecting a strong tendency not to participate in postsecondary education.

Youth with speech disabilities had mean scale scores that were at least .1 SD below the mean for the overall sample on 11 of the 19 scales. Although this group had a relatively large number of mean scale scores that differed noticeably from the means scores for the overall sample, the magnitude of those differences was not as extreme as those found for youth with learning disabilities. About half (9) of the mean scores for youth with hearing impairments were more than .1 SD below that of the overall sample, but again, huge deviations from the sample as a whole were not observed.

The group of youth with orthopedic impairments showed a fascinating pattern of mean scores. Over half (10) of their mean scores were more than .1 SD above the means for the overall sample. The only scale score that was noticeably below that obtained for the overall sample was related to extracurricular sports (M = 48.87). With few exceptions, the scores for youth with orthopedic impairments were higher that those for youth with other disabilities. These findings suggest that youth with orthopedic impairments possess above-average capabilities for independent living.

Youth identified as having other health impairments were surprisingly similar to the overall sample with respect to mean scale scores. Only one noticeable difference was observed between this group and the overall sample, and that was relatively small (group participation, $M = 51.09$).

Other Components of Independent Living

Earlier in this chapter it was indicated that the domains of generic services and mobility and transportation had so few variables in the data that they could not be factor analyzed to develop scales for measuring independent living on these components. Where the data were dichotomous, z-tests for significance in equal proportions in two independent samples were employed to compare those with handicaps to those without. Interval data in these components were analyzed using t-tests.

Mobility and Transportation

Three variables were investigated for the mobility and transportation domain. Of these, moving to a new area was significantly more important to the students with handicaps ($t = -7.52$, $p < .01$). No difference was found between the groups for the importance placed on living close to one's parents or the willingness to move to another town to find a job.

The interpretation of this significant finding is difficult. Each group was toward the end of the scale placing more importance on living close to their parents, but were less sure about moving for a job. It may represent a situation where some of those with handicaps felt that moving may provide a new start away from the preconceived notions and limitations that were being placed on them in their home areas.

Generic Services

The data for the generic services domain represented specific behaviors and skills that the individual would have demonstrated, such as in dealing with services and finding information, making appointments and reservations. On a question of whether they could arrange a trip out of town, the nonhandicapped sample felt that they were more capable than did those with handicaps ($t = -3.91$, $p < .01$). However, there were no significant differences between the groups in their perceived skills to find a job.

The job-finding skills and their implementation were further examined in a number of comparisons of the proportions of subjects in each sample responding about whether or not they could use, or had used, them. Thus, there is some longitudinal data to show the change from perceived abilities as seniors to the actual implementation of the skills after high school. Table 5.6 provides a comparison of the proportions of each group responding to items representing alternative methods of finding jobs, and a description of each the items. One can see a significantly larger proportion of those with handicaps who needed work made no active attempt to find any ($z = -3.21$, $p < .01$).

For the active job seekers, a number of differences are evidenced between the groups. The sample of students with handicaps was more likely to use a state employment agency ($z = -3.08$, $p < .01$), whereas the nonhandicapped would approach the employer directly ($z = 2.65$, $p < .01$). Additionally, those with handicaps reported that they were more likely to approach military recruiters for career assistance ($z = -2.06$, $p < .05$).

Significant differences were also evident when the samples indicated how they actually found their first jobs. The nonhandicapped group indicated they would approach employers directly, and this was the way a higher proportion of those students found their first jobs ($z = -2.59$, $p < .01$). Conversely, the public employment services that the students with handicaps had favored as seniors found jobs for a higher proportion of them ($z = 2.34$, $p < .05$). Scores on the unspecified "Other" category were also significantly different, with

Table 5.6. Proportions of Youth With and Without Handicaps Who Display Each Job-Seeking and Job-Finding Pattern

	Proportion of youth agreeing		
	With handicaps	Without handicaps	z
Where would you look for work?			
Did not look	7.8	5.3	-3.21**
State agency	15.2	11.8	-3.08**
Private agency	7.8	6.2	-1.92
Military recruiter	5.9	4.4	-2.06*
Employer directly	33.9	38.1	2.64**
Friends/relatives	55.3	54.7	-0.39
Answer/place advertisement	25.4	23.9	-1.10
Newspaper	59.8	59.9	0.07
School employment service	11.6	11.1	-0.51
Other	12.9	12.0	-0.83
How did you find your first job?			
School employment service	8.1	8.0	0.31
Public agency	3.0	2.3	2.34*
Private employment agency	0.8	0.7	0.71
Newspaper advertisement	6.3	5.8	1.04
Employer directly	23.4	25.7	-2.59**
Relative	22.8	23.4	-0.64
Friend	27.4	27.5	-0.09
Civil service appointment	0.3	0.3	0.28
Other	7.6	6.4	2.36*
Union registration	0.1	0.1	0.46

*p<.05 **p<.01

Note: The *z*-test is based on the nondirectional test for differences between youth with handicaps and youth without handicaps (that is, a two-tailed test for differences).

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

more students with handicaps choosing it ($z = 2.36$, $p < .05$), but this cannot be analyzed further without the means by which the jobs were actually found.

When comparing the ways in which these students found their first jobs, it is also useful to see which of their preferred methods did not work. By looking at the significant values for the seniors, and then how jobs were found, the one that is no longer significant is that of mil-

itary recruiters. What is more, the proportions who said they would look to the military are far higher than the proportions who actually found employment there.

From these data, it is shown that there is quite a variation in the abilities that the subjects believed they had in how to go about obtaining employment. But the skills that they believed they had to find jobs are to some extent matched by the ways in which they did find their first jobs. These figures may, however, mask some of the other factors that are significant, for example the comparative numbers of those with and without handicaps who find employment, the types of jobs they hold, and specific grants or schemes that may dictate patterns of applications. Most notable in potential factors contributing is the significant number of persons with handicaps who reported finding jobs through "other" means.

Summary

This chapter has traced the derivation and application of scales that assess five of the domains of independent living proposed in the definition, as well as comparisons within the other two domains. By using factor analysis, it was possible to examine each domain for its component parts and then to use these to look at the differences and similarities between various groups. In this way, we were able to see areas in which those with handicaps varied from those who do not have handicaps, as well as comparing the those with specific handicapping conditions.

The use of the derived scales has facilitated the identification of areas in which the nonhandicapped surpass those with handicaps, as well as providing more important information on the needs of those with differing handicapping conditions. Thus, they provide both a way of identifying "deficits" that those with handicaps may have, but also a way of focusing on areas which require more specialized attention. This should assist in the development of programs and curricula that are more sensitive to the needs of these specific groups.

One may consider some examples of the differences found to see where more directed attention is needed. The students who reported having orthopedic impairments scored highly on most of the derived independent living scales, except extracurricular sports. But a major concern for many members of this group is transportation. Other groups have different, and often far-reaching concerns. Those with learning disabilities are a prime example as they scored lowest on almost all of the scales, from computer skills to career aspirations. For this a very different type of approach is needed in enhancing their transition to independent, adult life.

Similarly, one may see that other factors tend to exacerbate the handicapping status. The comparisons of high school graduates and dropouts demonstrate the value placed on education, and the compounding effects that dropping out have on handicapped status. In almost every area, those students with handicaps who dropped out of high school had the lowest scores on the independent living scales, and the lowest aspirations for adult life. Although the students with handicaps who graduated from high school had lower scores than their nonhandicapped counterparts, their scores were still much higher than those of the dropout group, indicating levels of functioning that will be greater as adults in the community.

There are also significant gender-related differences between those with handicaps and their nonhandicapped peers. However, the effects here seem to be additive rather than interactions, with the male or female students being more different from the groups with or without handicaps.

In summary, the derivation of scales through the use of factor analysis has provided a good means by which to assess the differences between various groups of interest. By using these scales as assessment measures, it is possible to discover the aspects of independent living that are most troublesome for each of these groups. This information can then serve as a basis for the development of programs and specifically focused curricula to enhance these aspects of life and skill development in the specific cases, rather than just applying an

overall label, and an overall cure that does not meet the real needs of fostering the transition to adult independence.

Note

[1] Although the variables were initially standardized, missing values were subsequently replaced with mean values. Consequently, the variance of the variables decreased as the number of missing values increased.

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6

Associations of Independent Living Scales with Employment, Education, and Demographic Factors

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In the previous chapter, factor analyses of the *High School and Beyond* data were reported. These analyses were used to examine the nature of the dimensions of independent living and to compare various groups on these dimensions utilizing the scales derived. In this chapter, the derived scales from five of the seven components will be used to look at the relationships between the dimensions of independent living, and education and employment outcomes for individuals with and without handicaps.

Factor-Factor Correlations

The intercorrelations between the derived scales are presented for the entire sample of 14,830 subjects. Samples of this size are associated with considerable statistical power, and correlations can be statistically significant even though they account for a trivial amount of variance. To keep the focus on the more prominent relationships, only those correlation values which are greater than + or - 0.2 are discussed. A pattern of significant correlation values can be seen in Table 6.1.

The largest correlation is between the factors of career expectation and adult milestones (.63). Higher scores on the adult milestones scale are associated with reaching milestones (e.g., finishing full-time education, getting a regular job) later in life. High scores on the career expectation scale are associated with an interest in jobs that require postsecondary education rather than just a high school diploma. The correlation between these scales indicates that pursuing postsecondary education delays the attainment of certain adult milestones (e.g., obtaining a regular job, finishing full-time education). Similarly, there is a correlation between adult milestones and expectations about postsecondary education (.25). High scores on the latter scale are associated with attending a four-year college program, as opposed to vocational training. Thus, youth oriented toward vocational programs tend to reach milestones sooner than those who pursue four-year degrees.

In addition to its correlation with adult milestones, the career expectation scale is related to a number of other scales. Scores on this scale are positively correlated with the postsecondary education scale (.31), which indicates that the youth interested in jobs requiring postsecondary education are more likely to pursue a four-year college education than vocational or technical training. Also, career expectations are correlated with academic organization (.20), computer skills (.27), and technological skills (.28). As career expectations scale

Table 6.1. Correlation Among Independent Living Scales for Total Sample (N = 14,830)

Independent living scale	Independent living scale																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Computer skills	100	13	31	04	09	02	06	05	17	20	09	-01	08	11	09	-02	27	12	02
2. Resource utilization		100	14	11	12	-02	06	01	07	19	21	18	07	10	08	07	14	06	13
3. Technological skills			100	08	10	03	08	04	17	21	12	03	09	13	09	02	28	12	01
4. Life-style orientation				100	14	04	-02	01	10	09	21	11	10	05	09	00	12	07	-01
5. Academic organization					100	04	02	03	14	11	12	-12	12	13	01	-11	20	13	02
6. Financial support						100	-20	13	09	-01	00	-03	01	-01	00	-05	09	05	-03
7. Household composition							100	00	07	13	08	01	05	15	13	05	09	12	00
8. Tax exemption								100	06	03	00	-04	05	04	00	-01	06	04	-01
9. Adult milestones									100	20	13	-15	08	11	15	-07	63	25	-03
10. Group participation										100	25	06	27	44	19	01	24	13	09
11. Social roles											100	23	12	23	31	03	19	12	07
12. Social activities												100	00	03	09	14	-15	-07	06
13. Church participation													100	28	12	02	13	09	03
14. Extracurricular clubs														100	11	-03	18	14	09
15. Extracurricular sports															100	08	19	11	-01
16. Work experience																100	-09	-08	01
17. Career expectations																	100	31	-04
18. Postsecondary education																		100	-01
19. Special programs																			100

Note: Values greater than .03 in magnitude are significant at $p < .001$.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

is associated with pursuing postsecondary education, one would expect academic organization as well as computer and technological skills to be associated with it. As would be expected, computer and technological skills are positively correlated with each other (.31).

Group participation is highly correlated with a number of scales. It is correlated with membership in extracurricular clubs (.44) and with church participation (.27). Extracurricular clubs and church participation scales are correlated with each other (.28). Group participation is also correlated with adult milestones (.20), career expectations (.24), technological skills(.21), and computer skills (.20). This pattern of correlations contains many of the scales that have already been linked; it indicates that those youth with high scores for group participation tend to have high scores on scales related to technological and computer skills, postsecondary education, and delayed achievement of adult milestones.

The social roles scale is positively correlated with a variety of scales. These include group participation (.25), social activities (.23), extracurricular clubs (.23), extracurricular sports (.31), life-style orientation (.21), and resource utilization (.21). From these findings, it appears that those who are involved in more activities and have better resources utilization skills are perceived more favorably than their less involved and less skilled peers.

The only notable negative correlation in Table 6.1 is between the scales for household composition and financial support (-.20). As high scores on the household composition scale indicate that the students did not live with their families, the negative correlation indicates that those who lived at home received more support than those who did not.

After consideration of the pattern of correlations for the entire sample, it is useful to examine how these appear for the subsamples of those youths with and without handicaps. These data are presented in Table 6.2, with the values for those with handicaps in the upper right half of the table, and for those without handicaps in the lower left.

Table 6.2. Correlation Among Independent Living Scales by Handicapping Status (handicap, N = 4,469; nonhandicap, N = 10,232)

Independent living scale	Independent living scale																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Computer skills		15	33	04	09	00	05	02	17	21	10	-01	09	09	10	-03	28	13	01
2. Resource utilization	12		16	13	13	-02	04	02	10	20	20	21	09	10	09	07	16	08	10
3. Technological skills	31	12		09	09	01	08	05	16	21	07	03	08	10	10	01	29	14	-02
4. Life-style orientation	04	10	08		13	03	-02	02	10	10	16	11	11	01	09	-01	11	07	-03
5. Academic organization	09	10	10	13		02	02	01	12	11	08	-10	12	10	02	-11	17	12	02
6. Financial support	02	-02	04	05	04		-23	16	08	00	-02	-02	00	-04	-01	-03	05	01	-05
7. Household composition	06	06	07	-02	03	-19		-03	03	11	06	-01	05	14	11	04	07	11	-01
8. Tax exemption	07	00	03	01	04	12	01		05	04	03	-01	05	06	-03	01	06	04	00
9. Adult milestones	16	06	17	10	14	10	09	07		17	08	-12	06	08	12	-06	60	23	-04
10. Group participation	19	19	22	09	11	-02	14	02	21		22	07	29	45	20	02	24	12	08
11. Social roles	09	21	14	24	13	01	09	-01	14	26		25	12	22	30	05	16	09	08
12. Social activities	-01	17	03	11	-14	-04	01	-06	-17	05	23		03	03	11	13	-12	-07	06
13. Church participation	08	06	09	10	12	02	05	05	08	25	13	-02		28	13	03	11	08	05
14. Extracurricular clubs	12	10	14	08	15	00	15	04	13	44	23	02	27		14	-02	17	12	11
15. Extracurricular sports	08	07	09	09	01	01	13	01	16	18	32	08	11	10		10	18	07	-01
16. Work experience	-01	07	03	00	-10	-05	05	-01	-08	01	03	15	01	-03	07		-08	-09	04
17. Career expectations	26	12	27	11	20	10	09	06	64	24	20	-16	14	19	20	-08		30	-05
18. Postsecondary education	11	04	11	07	12	06	12	04	26	13	14	-08	10	14	13	-08	32		-03
19. Special programs	03	15	03	01	03	-01	00	-02	-02	09	07	C6	02	08	00	-01	-03	00	

Note 1: The top value in each pair is for youth with handicaps; the bottom value is for youth without handicaps.

Note 2: Differences are significant at $p < .05$.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

Youth With Handicaps

Examining the data for youth with handicaps, a pattern of correlations similar to the whole sample can be seen. Again, the correlations between adult milestones and career expectation (.60), and postsecondary education expectation (.23) are significant. So is the relationship between career expectation and postsecondary education (.30). The relationships between career expectation and computer skills (.28), and technological skills (.29) are also significant. This may indicate the need for such skills in those careers seen as having greater prestige and pay.

Group participation is also correlated significantly to a series of other factors. As before, it is significantly related to the factors of church participation (.29) and membership of extracurricular clubs (.45). Additionally, other factors are also significantly related: technological skills (.21) and career expectations (.24). However, there is also a significant relationship with computer skills for the sample with handicaps (.21).

Again, there is a positive relationship found between group participation and perceived social roles (.22). The factors of social activities (.25), extracurricular clubs (.22), and extracurricular sports (.30) are all positively related to social roles: continuing the higher involvement for those who are perceived of more highly, and who have more positive aspirations and abilities.

There was again the strong negative relationship found between household composition and financial support factors (-.23).

Youth Without Handicaps

When looking at the data for the youth without handicaps, the resulting correlation patterns are almost the same as those already reported. The highest correlation again occurs between adult milestones and career expectations (.64), with a strong relationships continuing between adult milestones and postsecondary education expectation (.26). Similarly, the re-

lationship between career expectation and postsecondary education expectation is also significant (.32).

Group participation is seen as again being significantly related to a number of other factors including extracurricular clubs (.44) and church participation (.25). It is also related to career expectations (.24), and technological skills (.22). For these youth, group participation is also significantly related to adult milestones (.21).

As with the previous findings, social roles were positively related to a number of other factors: group participation (.26), social activities (.23), extracurricular clubs (.23), extracurricular sports (.32), and life-style orientation (.24). In addition, social roles were also positively related to resource utilization (.21).

Youth with Handicaps Versus Youth without Handicaps

The pattern of correlations was remarkably similar for youth with handicaps and youth without handicaps, which indicates that the relationships among the independent living scales was roughly equivalent across the two samples. This finding is also an indication that the scales have essentially the same meaning for the two sets of youth.

Fisher *z* scores are used to compare the correlations obtained from the two samples. Although the patterns appear similar, there are significant differences in 24% of the 171 correlations tested, which is to be expected given the large sample sizes. Table 6.3 contains the pairs of correlations that are significantly different ($p < .05$). The top number in the pair is the correlation for the youth with handicaps, and the bottom number is the correlation for youth without handicaps.

The largest differences in correlations were associated with the social roles scale. This scale reflects the student's perceptions of how others view him or her (i.e., do others see you as popular, athletic, socially active, a good student, important, or part of the leading crowd). A consistent pattern indicated that the characteristics of youth without handicaps were related

Table 6.3. Correlation Among Independent Living Scales by Handicapping Status (handicap, N = 4,469; nonhandicap, N = 10,232)

Independent living scale	Independent living scale																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Computer skills								02 07											
2. Resource utilization			16 12	13 10					10 06			21 17	09 06				16 12		10 15
3. Technological skills											07 14			10 14					-02 03
4. Life-style orientation											16 24			01 08					
5. Academic organization											08 13	-10 -14		10 15					
6. Financial support							-23 -19	16 12						-04 00			05 10	01 06	-05 -01
7. Household composition								-03 01	03 09										
8. Tax exemption											03 -01				-03 01				
9. Adult milestones										17 21	08 14	-12 -17		08 13	12 16		60 64		
10. Group participation													29 25						
11. Social roles																	16 20	09 14	
12. Social activities													03 -02		11 08		-12 -16		
13. Church participation																			
14. Extracurricular clubs															14 10				
15. Extracurricular sports																		07 13	
16. Work experience																			04 -01
17. Career expectations																			
18. Postsecondary education																			
19. Special programs																			

Note 1: The top value in each pair is for youth with handicaps; the bottom value is for youth without handicaps.
Note 2: Differences are significant at $p < .05$.
Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

to how others perceived them. This relationship was weaker among youth with handicaps. This pattern was found for correlations between scores on the social roles scale and scale scores for life-style orientation (handicap .16, nonhandicap .24), technological skills (handicap .07, nonhandicap .14), academic organization (handicap .08, nonhandicap .13), adult milestones (handicap .08, nonhandicap .14), career expectations (handicap .16, nonhandicap .20), and postsecondary education (handicap .09, nonhandicap .14). These weaker relationships between these attributes and how youths with handicaps think they are perceived might indicate that different factors affect how they are perceived by others. As the scale is based on self-report rather than a polling of peers, this discrepancy between youth with and without handicaps might be due to differences in self-perception. Either way, these data suggest a fruitful area of research. Certainly, factors related to self-perception and perception by others must have an impact in the effectiveness of mainstreaming youth with handicaps.

The adult milestones scale is also associated with a number of significantly different correlations. Youth without handicaps have higher correlations than those with handicaps when scores on the adult milestones scale are correlated with scores on scales for career expectations (handicap .60, nonhandicap .64), social roles (handicap .08, nonhandicap .14), household composition (handicap .03, nonhandicap .09), social activities (handicap -.12, nonhandicap -.17), extracurricular clubs (handicap .08, nonhandicap .13), group participation (handicap .17, nonhandicap .21), and extracurricular sports (handicap .12, nonhandicap .16). However, it was the youth with handicaps who had the strongest relationship between the age at which adult milestones were reached and scores for resource utilization (handicap .10, nonhandicap .06).

When significant differences were found in the correlations involving resource utilization, these were almost always stronger for youth with handicaps. Differences were found in correlations between resource utilization and career expectations (handicap .16, nonhandicap .12), technological skills (handicap .16, nonhandicap .12), social activities (handicap .21, nonhandicap .17), life-style orientation (handicap .13, nonhandicap .10), and church participation (handicap .09, nonhandicap .06). These findings suggest that acquiring resource utilization

skills is more valuable for youth with handicaps than for those without. It seems to enable them to participate in church and social activities and is associated with a greater expectation to attend four-year college programs (as indicated by the career expectation scale). This increased expectation to attend four-year college programs as opposed to getting a job directly out of high school is consistent with the stronger positive correlation with adult milestones. Pursuing postsecondary education is associated with delays in reaching milestones such finishing full-time education, and getting a regular job. Although the correlations associated with these significant differences are often small in magnitude, a consistent pattern does emerge. These findings, in conjunctions with those discussed earlier, indicate that the resource utilization scale is tapping into an important skill for youth with handicaps.

Another scale that is associated with larger correlations among youths with handicaps than those without is the church participation scale. Significantly different correlations were found when relating this scale to group participation (handicap .29, nonhandicap .25). This difference suggests that church participation plays a larger role in the social networks of youth with handicaps than it does for youth without handicaps.

Extracurricular sports might serve a similar function for youth with handicaps. Differences were found when correlating the sports scale with scales for extracurricular clubs (handicap .14, nonhandicap .10) and social activities (handicap .11, nonhandicap .08). Youth who are more active in sports tend to be more active in clubs and engage in more social activities with friends. This link is stronger for youths with handicaps.

Examining the correlations involving the financial support scale, several of the significant differences were noteworthy. Stronger relationships were found for youth with handicaps when correlating financial support with household composition (handicap -.23, nonhandicap -.19). High scores on the household composition scale indicate the youth did not live with relatives. Hence, the negative correlation indicates that youth who received financial aid were more likely to live at home. Youth with handicaps also had a stronger relationship between financial support and being claimed as a tax exemption (handicap .16, nonhandicap .12).

The pattern of correlations among the scales of independent living are similar for both subsamples of youth. Some of the significant differences have been highlighted, but these differences tend to be relatively small in magnitude. Other differences between youth with and without handicaps can be identified by examining the correlations between these scales of independent living and demographic variables.

Factors and Demographics Correlations

The correlations between the derived scales and a set of demographic variables are shown for the entire sample in Table 6.4. Correlations between the independent living factors and the employment variables related to the first job held are relatively small. This is not surprising considering the nature of most first jobs. Hiring is obviously not based on a previous work record. The first job held by most youths who pursue postsecondary education is typically a part-time job for which the hourly rate of pay is not necessarily commensurate with the obtained level of education. It is assumed that job-related variables would have higher correlations if they were based on jobs held a few years later (e.g., after the completion of full-time education).

There are several correlations that should be discussed. The number of hours worked per week is negatively correlated with career expectations (-.18), postsecondary education (-.11), and adult milestones (-.11). A high score on the career expectation scale is associated with pursuing postsecondary education; a low score is associated with getting a job directly out of high school. A high score on the postsecondary education scale is associated with attending a four-year college program; a low score is associated with vocational training. Scores on the adult milestones scale reflect the age at which the milestones are reached. These milestones include completing full-time education and getting a regular job. Youth pursuing a four-year college degree would have high scores on all three scales and would

Table 6.4. Correlation of Independent Living Scales with Demographic Characteristics for Total Sample (N = 14,830)

Independent living scale	Demographic characteristic					
	Hourly rate first job	Hours worked per week	Duration of employment	High school GPA	Composite test score	SES
1. Computer skills	01	-05	03	19	25	20
2. Resource utilization	01	02	00	00	09	15
3. Technological skills	-02	-06	05	23	31	24
4. Life-style orientation	00	-04	02	10	10	08
5. Academic organization	-02	-09	00	29	15	06
6. Financial support	00	-06	01	08	09	10
7. Household composition	01	07	-01	15	16	13
8. Tax exemption	-01	-05	01	11	12	05
9. Adult milestones	00	-11	00	28	35	27
10. Group participation	01	-03	00	18	18	19
11. Social roles	03	-01	01	12	07	16
12. Social activities	02	05	00	-20	-15	05
13. Church participation	-02	-05	00	08	08	09
14. Extracurricular clubs	-01	-08	-05	25	13	13
15. Extracurricular sports	03	06	-02	05	09	15
16. Work experience	00	10	08	-09	-03	01
17. Career expectations	-01	-18	06	42	50	41
18. Postsecondary education	00	-11	-03	22	25	23
19. Special programs	00	00	-04	-07	-11	-04

Note: Correlation greater than .03 in magnitude are significant at $p < .001$.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

probably work fewer hours per week than youths who seek employment directly after high school. Hence, these three correlations are expected to be negative.

With the education variables there are a number of correlations with a magnitude of at least .20. High school GPA is correlated with a number of factors. The strongest relationship is with career expectations (.42). High scores on this scale are associated with attending some form of postsecondary education. High GPA scores would be expected to predict this. A similar explanation may be made for the correlation with postsecondary education (.22) which distinguishes between those seeking four-year degrees and those seeking vocational training. Academic organization is another factor that correlates with GPA (.29) as, presumably, the student is more prepared and motivated for school. Other important factors correlating with GPA are technological skills (.23), and membership of extracurricular clubs, most of which were academic in orientation (.25).

Although extracurricular clubs were positively correlated with GPA, the social activities scale was negatively correlated with GPA (-.20). The only other scale with a large correlation with GPA was the tax exemption scale (.28), which might be related to the financial dependence of youth with high GPAs who go on to postsecondary education or to the higher income of these families, which is an incentive for parents to claim this exemption.

Performance on the HSB composite test battery is represented by the "composite test score" in Table 6.4. This test is highly correlated with career expectations (.50), postsecondary education (.25), technological skills (.31), and computer skills (.25). Tax exemption status was also correlated with the test score (.35).

The pattern of correlations between the scales and socioeconomic status (SES) is quite similar to that found for the composite test score. SES is positively correlated with career expectations (.41), postsecondary education (.23), technological skills (.24), computer skills (.20), and tax exemption (.27).

Table 6.5. Correlation of Independent Living Scales with Demographic Characteristics by Handicapping Status

Independent living scale	Demographic characteristic											
	Hourly pay first job		Hours worked per week		Duration of employment		High school GPA		Composite test score		SES	
	HC	NHC	HC	NHC	HC	NHC	HC	NHC	HC	NHC	HC	NHC
1. Computer skills	-01	02	-03	-06	01	03	19	19	27	24	22	19
2. Resource utilization	-01	03	02	02	00	01	04	-02	14	06	13	13
3. Technological skills	-01	-02	-06	-06	05	04	21	22	33	29	26	22
4. Life-style orientation	02	-01	-04	-03	00	03	12	08	12	07	09	07
5. Academic organization	-01	-03	-09	-09	-01	01	27	29	15	12	07	04
6. Financial support	00	-01	-06	-07	03	01	03	09	07	09	09	09
7. Household composition	01	02	06	08	-06	-12	14	15	15	17	09	15
8. Tax exemption	01	-01	-06	-04	01	01	10	11	09	12	03	05
9. Adult milestones	00	00	-09	-12	00	-01	24	29	32	35	25	27
10. Group participation	02	00	-02	-04	02	-01	16	19	18	20	19	19
11. Social roles	03	03	01	-01	04	-01	07	14	01	10	12	18
12. Social activities	01	03	07	04	01	00	-19	-20	-12	-17	06	05
13. Church participation	-01	-03	-05	-05	00	01	13	17	05	09	09	09
14. Extracurricular clubs	00	-02	-05	-10	-05	-05	21	27	09	15	12	14
15. Extracurricular sports	02	04	05	06	01	-03	04	05	07	09	13	16
16. Work experience	-01	00	10	09	08	08	-09	-09	-04	-02	00	02
17. Career expectations	-02	00	-15	-18	06	06	40	42	49	50	41	40
18. Postsecondary education	00	00	-11	-11	-03	-03	21	22	25	25	21	23
19. Special programs	00	00	02	-02	-02	-05	-08	-06	-14	-08	-05	-03

Note 1: HC = Students with handicaps, NHC = Students without handicaps

Note 2: Values greater than .03 in magnitude are significant at $p < .001$.

Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

Once again, it is possible to examine the correlations between the independent living factors and these other variables for the subsamples to look for differences in the values, and the patterns of these values. These sets of correlations are displayed in Table 6.5.

Youth With Handicaps

Examining the data for youth with handicaps, the same pattern of correlations appear--although all the correlation values are slightly lower than for the whole sample. With GPA, the same factors correlate significantly. Career expectations (.39) and postsecondary education (.21) again go together in the pattern. As well, the factors of technological skills (.21), academic organization (.27), tax exemption status (.24), and membership of extracurricular clubs (.21).

With the composite test variables, it is again the same set of variables as for the entire sample. The correlations for computer skills (.27) and technological skills (.33) were slightly higher for the sample with handicaps than they were for the total sample. Other factors, tax exemption status (.32), career expectations (.49), and postsecondary education (.25) are still significant, but slightly below the values reported for the whole sample.

On the socioeconomic status variable, one finds a similar pattern as the youth with handicaps have slightly higher correlations for computer skills (.22) and technological skills (.26) than did the entire group. For the remaining factors, there were slightly lower correlations: tax exemption status (.25), career expectations (.41), and postsecondary education (.21).

Youth Without Handicaps

When one examines the results for youth without handicaps, there are a number of differences apparent, as well as a number of similarities. The most striking differences come in the correlation between GPA and social activities (-.20), and socioeconomic status and computer skills which just fails to reach the significance level of 0.2. These seem to indicate that,

for the youth without handicaps, too much participation in social activities can be detrimental to academic performance, and that computer skills are not quite as important.

The remainder of the correlations found to be significant for the entire sample and the subsample with handicaps are also significant for the sample without handicaps. With GPA there are still the findings of significant relationships with technological skills (.22), academic organization (.29), tax exemption status (.29), extracurricular clubs (.27), career expectations (.42), and postsecondary education (.22).

Correlations with the composite test score showed the following to be significant: computer skills (.24), technological skills (.29), tax exemption status (.35), career expectation (.49), and postsecondary education (.25). For socioeconomic status they were: technological skills (.22), tax exemption status (.27), career expectation (.40), and postsecondary education (.23).

Again, the patterns that emerge from the use of different samples are relatively constant--with only a slight variation in the values found. The most notable feature of the analysis is the failure of any of the independent living factors to be correlated significantly with any of the three employment variables.

With the remaining variables, there was relative consistency across the samples, with minor variations in the correlation values found. The exceptions to this were the appearance of a significant negative finding for the nonhandicapped sample in the relationship between GPA and social activities, and the failure of the correlation between computer skills and socioeconomic status to reach significance in the nonhandicapped sample.

Youth With Handicaps Versus Youth Without Handicaps

Comparing the correlations across the two subsamples, some familiar patterns arise with respect to the social roles and resource utilization. Again, scores on the social roles scale (an indication of how others perceive the youth) show stronger links to the attributes of the youth when that youth does not have handicaps: GPA (handicap .07, nonhandicap .14),

composite test score (handicap .01, nonhandicap .10), and SES (handicap .12, nonhandicap .18). This finding indicates that how youth with handicaps think they are perceived by others is not closely related to these attributes. These attributes are more closely related to how youth without handicaps think others perceive them.

The resource utilization scale showed two interesting differences. This scale was positively correlated with GPA for youth with handicaps (.04) and negatively correlated for youth without handicaps (-.02). The scale was positively correlated with the composite test score for both subgroups (handicap .14, nonhandicap .06), but the correlation was much stronger for those with handicaps. These correlations are small in magnitude, but the pattern of differences is consistent with the pattern observed in the factor-factor correlations.

The church participation scale revealed stronger relationships with GPA (handicap .13, nonhandicap .17) and the composite test score (handicap .05, nonhandicap .09) for nonhandicapped youth. A similar pattern was obtained for scores on the extracurricular clubs scale with GPA (handicap .21 nonhandicap .27) and test scores (handicap .09, nonhandicap .15). The opposite was found for the life-style orientation scale. The relationship with GPA (handicap .12, nonhandicap .08) and test score (handicap .12, nonhandicap .07) was stronger for youth without handicaps.

Turning to the living arrangements component, financial support had a higher correlation with GPA for nonhandicapped youth (handicap .03, nonhandicap .09). The same pattern was found when correlating household composition to SES (handicap .09, nonhandicap .15).

Among other notable differences was the awareness of special programs scale, which had a larger negative correlation with scores on the composite test for youth with handicaps (-.14) than for youth without handicaps (-.08). Social activities had a larger negative correlation with scores on the composite test for youth without handicaps (-.17) than for youth with handicaps (-.12). Finally, adult milestones were more closely linked to GPA for those without handicaps (.29) than for those with handicaps (.24).

Summary

For the total sample, the pattern of intercorrelations among independent living scales are consistent with a priori expectations. When the sample is divided by handicapping status, a number of significant, but relatively small, differences are observed.

The independent living scales are not highly correlated with the the variables related to early employment histories. Stronger relationships are found between scores on these scales and GPA, test scores, and socioeconomic status. When dividing the sample by handicapping status, similar patterns are found for youth with and without handicaps. While some differences are noted, they tended to be relatively small in magnitude.

Whereas Chapter 5 highlighted differences in the means of scale scores by handicapping conditions, this chapter has highlighted relatively similar patterns of relationships among the scales for youth with and without handicaps. In combination, these findings add to our understanding of the meaning of these components of independent living.

7

Summary

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The transition from high school to the various aspects of adult life is a complex mixture of demands and new freedoms. The young person gets the withdrawal of many of the demands that are placed on children and has the chance to undertake, and experiment with, many options of life-style and future goals. It is a period in which one has the chance to remove the bonds of childhood and replace them with the robes of adulthood.

For persons with handicaps, however, the transition from school to the community is often fraught with many more obstacles and demands to be faced and overcome. Not only is the person faced with the fact of having a disability, but this disability is often compounded by the environment in which the person lives and operates (Clowers & Belcher, 1979). Different types of disabilities raise various expectations in the minds of those with whom the person with handicaps must interact, and who often have a large say over where he or she will be after the transition.

In this volume of the *Digest*, we have attempted to focus on a number of the complex factors that make up transition. These factors have been explored with emphasis on the various outcome areas associated with adult life in our society, as well as the variations that occur between demographic groups, achievement level, and specific handicapping conditions. In much of this, we have been guided by Will's (1984) model of the differing modes of service delivery for those who have handicaps.

Distribution of Handicapping Conditions

P. L. 94-142 mandates that states keep records of the types and severity of handicapping conditions that occur within their boundaries. States must provide this information annually to the U.S. Department of Education to demonstrate compliance with the law. This information should not just show the total numbers of persons with specific handicapping conditions; it should be broken down to illustrate the specific needs of groups within each state to facilitate adequate planning and funding of services.

The ways in which such information is broken down is crucial in understanding the differing service demands between states, and the changes that may occur with time within specific states. That is, the concentration of specific handicapping conditions vary widely between states, often as a result of the diagnostic standards and definitions employed. As well as the distribution by state, there is also the concern of the distribution of handicapping conditions by the ages of the persons involved. Specific conditions appear at different ages, or are remediated and so disappear again.

Whatever the circumstances, the distribution of handicapping conditions among states, and the age distribution within states, are critical factors in the planning and delivery of services. Use of information, as mandated in P. L. 94-142, is an initial step in the needed process of planning and the interagency cooperation that should be the hallmark of the rehabilitative services in working with persons with handicaps across their lifespan. But such work stresses the need for the availability of information that is timely, accurate, and accessible to all those who have the responsibility for planning and delivering services.

Longitudinal Data

A key to successful transition planning is the availability of quality information about the individual across time. This information can allow the examination of the changes that have occurred for the person, the services received, and the levels of achievement attained. Such information is critical where there are multiple agencies involved in the delivery of services and where agencies take over responsibility for the services to a person at various phases of the transition.

The report on the development of the longitudinal data base system in the LaGrange Educational Area (see Chapter 3) is a model for a system that can track a person through secondary school and provide the necessary information to agencies that will serve the person's needs after that. In this way, data are available to ensure that all the needs of the person will be served and to allow for systematic transition planning and review. The major features of the data base should include: (a) a systematic method of collecting data, (b) the clear allocation of responsibility for collecting and entering data, and (c) the availability of information to agencies and persons responsible for planning and delivering services in the transition process. When this data base is interfaced with others that hold relevant data on a given individual, the information can be put to use in a number of ways to benefit the person in transition.

Employment Transitions

Employment is a critical factor in the study of transition, because it is one of the most important factors in defining a person's role in society, as well as providing for one's financial security. However, for persons with handicaps, the employment outlook is often very bleak. In Chapter 4, employment patterns are linked to the level of education received by persons with handicaps and the suitability of the curricula for transition to employment.

The specific handicap that a person has is seen as a determining factor in the type and level of employment that the person attains. But it is not just the handicapping condition that is crucial in this regard. A significant factor is whether the person completed high school or

dropped out. With all handicapping conditions, those who dropped out of high school have a much poorer chance of gaining meaningful and financially rewarding employment. It was found that high school graduates fared better in employment than did dropouts, regardless of handicapped status.

The findings reported in Chapter 4 indicate that persons with handicaps often lack the skills and experience necessary for a successful transition into the competitive workforce. This deficit is seen as a function of the educational components they receive. It is especially critical for those who drop out, because they will miss out on even the few opportunities currently provided. Again, this represents an area in which a longitudinal data base for students might aid in planning transition and follow-up services to meet the specific needs of an individual.

The importance of the transition to employment has impacts on other aspects of the person's adult life. Employment not only provides an income, it also provides social identity and a forum for social interaction with others (Jahoda, 1979). Without employment, a person is often deprived of these aspects of an independent adult life.

Independent Living

The aspects of adult independent living are varied and complex. Independent living requires the individual to possess an array of skills and to implement these as behaviors at the appropriate times. As they are skills, these are behaviors that the person is able to learn and needs to be able to practice. In Chapters 5 and 6, the array of independent living skills have been examined; the various patterns that have arisen because of handicapping condition, educational attainment, or demographic factors have been reviewed.

A seven-part definition that identified skills and behaviors necessary for successful transition to adult life was analyzed using items selected by expert judges. This technique facilitated identification of factor structures for the underlying components of five of the domains. Based on the factor structures, scales were constructed to assess the levels of func-

tioning in each skill area. Reliability coefficients for the scales indicated that the scale items were homogeneous within scales and heterogeneous across scales, which was consistent with the multidimensional conceptualization of independent living.

Using the scales derived through the factor analysis procedure, comparisons were made which demonstrated the varying levels of independent living skills among a number of identified groups. Thus, when one compared the level of independent living of those persons with handicaps to those without, there were clear differences on many of the scales indicating that those without handicaps generally had higher level of independent living skills. Comparisons were also made among groups on the grounds of specific handicapping conditions. Those who reported having a specific learning disability had very low levels of independent living skills on many scales, whereas those who reported orthopedic impairments were able to function at a much higher level. In fact, the scores for the latter group were at or above the mean scores for the total sample on almost every scale. Their scores were particularly high on scales that measured academic achievement and future plans.

Demographic factors were shown to exacerbate the differences found on the independent living scales. The most crucial was the graduate status of the student. On many of the independent living scales, those who had graduated from high school scored more highly than those who had dropped out, regardless of their handicapping status. An exception to this was that the dropouts were more likely to reach adult milestones at earlier ages, a sign of independent living in one way, but also detrimental to their chances of taking advantage of the benefits of further education and other growth experiences available to those who wait until they are older before reaching the milestones.

On the scales that assess career expectations, those students who dropped out of high school scored .8 SD below the mean for the population, indicating that they were expecting to take up much lower status and lower paying occupations. The dropouts also lacked computer and technological skills when compared to both groups who had graduated, and their expec-

tations for undertaking postsecondary education was also much lower. Thus, graduation from high school seems a critical factor across many independent living domains.

In comparing the independent living scales scores to a number of other demographic and achievement factors, another pattern appears. There is a consistently significant set of correlations between derived independent living scales and high school GPA, the HSB composite test score, and the socioeconomic status of the students. Thus, we see positive relationships between these demographic factors and computer and technological skills, and career and postsecondary expectations. Social activities scale scores are negatively related to GPA and composite test scores.

Conclusion

The findings reported in this volume provide a picture of the types of information that are available for youth in transition, and the ways in which that information can be used. As has been pointed out, there is a great need for the development of sound and readily accessible sources of information that can be used to plan the service delivery by agencies and the transition needs of specific individuals. This volume has attempted to address the ways in which such information can be gathered and the ends to which it can be focused.

If one is to use the "bridges of transition" (Will, 1984) effectively and efficiently, there must be a concerted effort to utilize available information, to recognize the desired destinations, and to find the best ways to get there. Although Will has emphasized the transition to employment, there are others (e.g., Halpern, 1985) who see that transition has wider goals. In many ways, transition is a process that leads one from the preparatory phase of high school to the roles and demands of adult life. It is not sufficient only to be prepared for employment when there are so many other aspects of life that one must face.

The transition phase is based upon the completion of high school. However, so many youth with handicaps are not reaching this level. The problems faced by youth with handicaps in adult life are exacerbated by dropping out of high school. The information available should be used to identify those at risk and to implement remedial action.

The aims of this volume have been to illustrate potential data sources, ways in which they can be used, and the problems to which their results can be applied. The problems and concerns of those with handicaps, those who provide services, and those who formulate policy can be better served by the availability of timely and accessible information grounded in solid research.

From the data reported, there are clear indications that one of the most important factors that have an impact on the successful independent living outcomes for youth in transition, regardless of handicapping status, is graduation from high school. As was reported in Chapter 4, those who drop out have much lower success rates in their transition to employment. In Chapter 5, the results indicate that the transition to other aspects of life is also inhibited by failure to complete high school and exacerbated by reaching adult milestones too early.

The work presented in this volume serves as a foundation for building a systematic approach to the research and practice of transition. It provides guidance in practical matters to gather and utilize information in such a way that it develops an overall picture of the person with a handicap across time, and examines the services needed and who should provide them. The surrounding issues are examined, with an analysis of the problems that are currently faced in planning the transition to vocational outcomes, and the areas of curriculum restructuring identified. Lastly, the general skills of independent living are studied to demonstrate areas of need that must be faced by the educational systems to develop in all our young people a sense of and ability to control their own lives and to be self-determining in their choices and actions as responsible adult citizens.

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Appendix A

Number of Children Ages 3-5 Years Served Under EHA-B
by Handicapping Conditions During School Year 1984-1985

State	All conditions	Learning disabilities	Speech impairments	Mental Retardation	Emotional disturbances	Hearing impairments & deafness	Multihandicaps	Orthopedic impairments	Other health impairments	Visual impairments	Blindness & deafness
AL	3047	43	2614	211	31	43	63	31	4	7	0
AK	633	35	528	4	2	16	32	11	3	2	0
AZ	2086	87	1535	250	26	40	65	51	1	31	0
AR	2473	58	2086	131	4	45	80	26	31	12	0
CA	21312	2309	12325	2781	148	928	932	1203	466	206	14
CO	1899	383	973	67	67	64	249	73	0	23	0
CT	3503	299	2506	200	175	89	111	43	74	6	0
DE	805	326	320	78	72	3	3	0	0	3	0
DC	515	24	445	3	11	7	6	4	14	0	1
FL	7307	149	5568	679	231	218	0	279	125	56	2
GA	4710	51	3575	480	368	78	0	86	8	64	0
HI	512	40	287	43	3	27	44	56	0	12	0
ID	1253	124	797	157	11	11	62	36	48	6	1
IL	20572	2645	15790	720	899	142	0	256	82	38	0
IN	4865	56	4335	250	20	61	113	20	1	8	1
IA	5497	141	3464	1205	202	126	84	247	0	27	1
KS	2488	108	1879	218	43	66	42	61	26	35	10
KY	4005	31	3604	194	16	30	53	30	27	18	2
LA	6072	494	4051	736	52	182	186	128	194	45	4
ME	2465	91	1548	283	146	83	122	71	58	63	0
MD	5930	249	4211	368	52	132	468	200	198	49	3
MA	6534	391	3163	1189	536	223	248	333	386	65	0
MI	12572	1703	8635	562	311	348	15	875	0	97	0
MN	8323	945	5472	899	231	214	0	336	161	56	9
MS	1492	2	1285	123	0	10	24	43	0	5	0
MO	6449	479	5047	239	196	54	285	68	34	13	34
MT	1565	109	1272	71	5	22	46	20	13	4	3
NE	2761	165	1926	280	40	47	105	175	0	23	0
NV	799	142	475	27	4	18	111	14	0	8	0
NH	1011	22	810	36	9	1	52	37	42	1	1
NJ	12180	389	7972	109	50	67	3537	38	6	10	2
NM	1210	55	683	179	66	19	106	57	34	11	0
NY	7243	721	4326	331	464	168	216	123	792	86	16
NC	6157	51	5199	485	38	60	127	113	62	22	0
ND	948	71	723	81	6	23	0	27	10	6	1
OH	7699	165	6151	282	90	388	362	216	0	45	0
OK	5703	142	4516	257	15	131	454	105	38	33	12
OR	1393	62	1172	37	14	20	0	44	28	16	0
PA	8535	468	6824	707	141	193	0	138	0	64	0
RI	1180	391	510	128	50	26	19	32	14	10	0
SC	5000	22	4079	535	14	84	128	73	31	34	0
SD	895	53	546	58	9	31	128	57	4	8	1
TN	7570	169	6402	376	45	128	239	132	38	40	1
TX	19570	2782	12855	1461	198	120	545	691	658	246	14
UT	2364	269	1324	183	223	23	254	47	25	8	8
VT	478	16	417	35	1	4	0	3	1	1	0
VA	9798	1240	6925	581	191	150	488	129	34	57	3
WA	4990	217	3342	676	122	168	184	187	64	30	0
WV	2293	61	1964	128	30	33	0	33	33	10	1
WI	8337	1025	5415	822	476	181	162	166	50	40	0
WY	392	24	326	23	4	7	0	4	4	0	0

Source: calculated from U. S. Department of Education, Office of Special Education and Rehabilitative Services, Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act, Table XXX, 1985.

Number of Children Ages 6-11 Years Served Under EHA-B
by Handicapping Conditions During School Year 1984-1985

State	All conditions	Learning disabilities	Speech impairments	Mental Retardation	Emotional disturbances	Hearing impairments & deafness	Multi-handicaps	Ortho-pedic impairments	Other health impairments	Visual impairments	Blindness & deafness
AL	36756	8639	15379	9316	2127	310	438	196	202	133	16
AK	4469	2313	1679	96	104	59	66	115	15	13	9
AZ	24517	10986	8967	1797	1892	245	281	180	55	114	0
AR	20701	8654	6882	4537	209	160	134	29	65	30	1
CA	180636	89054	66910	8135	2952	2421	1791	2402	5983	940	48
CO	20638	9403	5836	1131	2915	311	609	306	0	127	0
CT	27120	12037	9125	1232	3675	234	250	137	415	15	0
DE	4923	2669	1228	259	715	25	9	8	7	3	0
DC	1642	515	1038	33	32	23	1	0	0	0	0
FL	79369	27411	34901	7299	7686	551	0	833	400	276	12
GA	46778	11792	18528	8440	6983	370	0	346	131	187	1
HI	5396	2831	1775	358	128	95	68	107	4	30	0
ID	9086	4258	3299	1026	183	152	2	91	50	25	0
IL	101699	38939	49678	5988	5365	709	0	455	357	208	0
IN	54217	12927	32221	6840	1338	325	251	150	17	147	1
IA	25604	8539	10090	3977	1940	320	211	448	0	74	5
KS	20497	7078	9309	2129	1229	187	167	198	114	78	8
KY	37184	7940	20371	6589	926	279	482	193	189	185	30
LA	31456	11664	14429	2676	1198	434	210	261	423	159	2
ME	12515	4419	4402	1489	1404	167	246	213	130	44	1
MD	40246	18476	16644	1703	1033	485	1155	281	250	208	11
MA	55860	20640	12569	11731	7709	670	1117	447	670	279	28
MI	67799	22502	31129	4475	6487	1031	23	1832	0	322	0
MN	35680	15718	12014	4190	1967	630	0	633	355	158	15
MS	28311	8707	14423	4488	202	149	111	163	0	68	0
MO	48370	16962	22049	5189	2879	348	246	389	185	99	24
MT	7777	3385	3347	474	247	58	127	51	55	26	7
NE	14523	4775	6576	1743	816	148	170	233	0	62	0
NV	6731	3481	2312	364	350	42	91	45	25	21	0
NH	6153	3568	1762	267	348	4	47	36	121	0	0
NJ	81890	27698	46527	1682	3111	497	1876	292	122	83	2
NM	13165	4256	5906	808	1125	119	316	163	437	32	3
NY	104037	51855	20657	7521	12502	1009	1796	513	7671	499	14
NC	52141	19120	20313	7583	2784	664	464	409	568	235	1
ND	6168	2344	2940	574	154	67	0	56	15	18	0
OH	94210	27670	45587	14586	2212	961	1657	1140	0	388	9
OK	32990	11683	15296	4445	470	250	453	177	87	109	20
OR	22568	11122	9518	597	759	122	0	237	170	43	0
PA	87525	24499	46873	10223	4045	1071	0	368	0	442	4
RI	8252	5104	2266	279	371	67	6	84	45	29	1
SC	34407	9970	14987	5643	2617	451	76	352	95	215	1
SD	6938	1441	4575	476	94	68	189	69	[illegible]	17	2
TN	45607	16717	20620	4995	907	619	644	424	[illegible]	305	13
TX	138337	65879	49996	8592	6900	355	1486	1474	2941	681	33
UT	24390	8636	6937	1388	6521	178	461	119	90	45	15
VT	4162	1733	1823	394	90	38	4	28	40	12	0
VA	43171	20548	11504	5982	3382	509	699	208	110	221	8
WA	30098	13856	10058	2727	1219	480	436	397	818	106	1
WV	19882	6297	9471	3071	658	135	0	106	43	100	1
WI	30241	11177	10623	3623	3578	394	252	307	150	131	6
WY	5234	2294	2030	274	369	51	0	74	120	20	2

Source: calculated from U. S. Department of Education, Office of Special Education and Rehabilitative Services, Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act, Table XXX, 1985.

Appendix B

Number of Children Ages 12-17 Years Served Under EHA-B
by Handicapping Conditions During School Year 1984-1985

State	All conditions	Learning disabilities	Speech impairments	Mental Retardation	Emotional disturbances	Hearing impairments & deafness	Multi-handicaps	Ortho-pedic impairments	Other health impairments	Visual impairments	Blindness & deafness
AL	40823	15389	1376	20036	2738	309	323	203	302	140	7
AK	3206	2610	137	139	155	48	48	38	14	14	3
AZ	21735	13983	866	2667	3012	279	284	190	340	114	0
AR	19669	11804	649	6657	227	108	112	28	46	38	0
CA	148913	106837	12598	11011	5027	2427	1714	2835	5476	940	48
CO	18467	9972	872	1827	4646	327	495	219	0	109	0
CT	27391	15151	1304	2328	7645	225	200	110	407	16	3
DE	5144	3091	140	509	1316	32	10	24	18	4	0
DC	1073	741	141	94	69	18	0	6	3	1	0
FL	63207	31245	10224	10852	8221	517	0	675	1228	234	11
GA	44008	18748	2201	13078	8929	400	0	272	188	190	2
HI	5549	4283	238	570	232	99	36	69	0	22	0
ID	5971	3716	392	1208	308	90	70	79	80	28	0
IL	78713	46791	5075	13326	11439	637	0	463	732	249	1
IN	34533	17752	3707	10843	1478	259	178	154	11	150	1
IA	23079	12368	653	5682	3446	297	263	300	0	64	6
KS	15284	8767	471	2958	2459	146	64	138	199	78	4
KY	27931	12981	1676	10759	1397	175	301	169	321	149	3
LA	34607	22687	3059	5252	2168	341	172	217	562	144	5
ME	10064	4827	617	1991	2023	105	147	104	202	48	0
MD	37337	25623	4263	3141	2263	353	934	223	263	272	2
MA	58349	21560	13129	12253	8052	700	1167	467	700	292	29
MI	62902	34891	3316	9137	12616	1092	1	1478	0	399	0
MN	33035	18809	1548	6236	5171	449	0	376	276	156	14
MS	18692	10749	1337	6133	183	134	39	87	0	30	0
MO	37409	20400	2549	9088	4056	285	179	306	421	104	21
MT	5384	3821	247	625	390	42	140	24	70	17	8
NE	11429	6636	534	2452	1349	169	69	176	0	44	0
NV	5538	3994	269	416	440	58	92	162	80	27	0
NH	6403	4867	280	387	741	4	29	26	69	0	0
NJ	60966	37503	5789	4314	10053	550	1669	372	602	108	6
NM	12117	6356	1837	1151	1454	127	305	115	737	32	3
NY	125556	70947	4681	14036	21455	1245	2108	654	9684	728	18
NC	52098	30922	1696	14231	3400	490	321	327	502	206	3
ND	3854	2550	237	764	217	32	0	33	9	12	0
OH	82622	42460	4652	26950	4136	839	1164	2043	0	373	5
OK	23100	15206	772	6044	507	181	157	94	90	46	3
OR	16892	12916	1164	942	1283	110	0	237	190	50	0
PA	73526	38807	5640	19447	7464	1160	0	437	0	566	5
RI	7989	6207	305	567	677	57	6	55	92	20	3
SC	28928	12437	1375	10929	3268	343	58	289	39	188	2
SD	3651	2071	336	689	288	49	141	22	23	25	7
TN	39302	24202	1803	9092	1323	563	559	413	1109	234	4
TX	112304	78125	4321	12128	11431	403	1120	1353	2775	637	11
UT	12470	5355	264	1405	4778	89	341	94	86	51	7
VT	2969	1796	291	554	203	43	4	22	36	19	1
VA	43172	20548	11505	5982	3382	508	699	209	110	220	9
WA	26634	18604	732	3491	2012	374	375	222	712	107	5
WV	17960	9892	1507	5120	1086	137	0	105	31	79	3
WI	30089	15915	1523	5718	6125	244	149	147	165	99	4
WY	3685	2523	175	353	497	36	0	39	51	11	0

Source: calculated from U. S. Department of Education, Office of Special Education and Rehabilitative Services, Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act, Table XXX, 1985.

Number of Children Ages 18-21 Years Served Under EHA-B
by Handicapping Conditions During School Year 1984-1985

State	All conditions	Learning disabilities	Speech impairments	Mental Retardation	Emotional disturbances	Hearing impairments & deafness	Multi-handicaps	Orthopedic impairments	Other health impairments	Visual impairments	Blindness & deafness
AL	7389	1972	51	4623	380	65	138	41	87	29	3
AK	266	174	3	51	5	6	19	5	2	1	0
AZ	2185	969	17	764	211	39	68	42	51	24	0
AR	1827	906	20	844	6	29	11	4	6	0	1
CA	15506	6567	415	5335	568	579	827	509	517	140	49
CO	1688	776	14	402	326	53	74	31	0	12	0
CT	4252	1383	55	1022	1588	64	59	33	44	4	0
DE	483	237	7	103	128	2	1	2	1	1	1
DC	170	92	8	59	2	1	1	1	5	0	1
FL	5971	2277	184	2613	472	128	0	138	132	24	3
GA	3948	1207	59	2194	340	70	0	52	13	11	2
HI	344	197	7	93	16	16	6	6	0	3	0
ID	1466	318	19	340	36	31	194	182	333	13	0
IL	7040	2755	175	2428	1451	62	0	71	76	22	0
IN	2658	1164	70	1240	92	33	28	20	0	11	0
IA	2727	997	20	1241	247	32	130	43	0	15	2
KS	1299	490	4	564	179	11	22	16	9	2	2
KY	2671	913	29	1484	49	35	89	17	30	22	3
LA	4454	2088	162	1744	180	80	54	30	89	24	3
ME	1012	378	17	389	136	14	41	9	22	6	0
MD	4848	2307	266	1406	392	60	195	79	107	34	2
MA	5228	1605	151	1736	1051	131	225	94	84	151	0
MI	7300	2893	74	2671	928	333	52	339	0	71	0
MN	3104	1180	57	1452	294	43	0	33	28	13	4
MS	2384	1054	43	1207	14	26	17	22	0	0	1
MO	3575	1501	85	1492	290	43	45	70	37	7	5
MT	576	327	9	168	23	6	27	6	7	2	1
NE	1246	518	15	556	68	27	29	28	0	5	0
NV	401	202	6	84	12	13	76	4	4	0	0
NH	569	405	14	92	37	0	8	6	7	0	0
NJ	6727	2948	195	1790	1062	125	415	77	94	16	5
NM	1294	427	118	538	75	17	56	23	37	3	0
NY	14277	5508	124	4296	2072	427	534	128	1086	101	1
NC	5605	2371	38	2731	186	57	85	55	62	20	0
ND	387	165	5	190	11	4	0	8	3	1	0
OH	7556	2761	93	3694	261	179	280	246	0	38	4
OK	1744	877	21	739	29	34	20	9	8	6	1
OR	1544	868	46	327	107	18	0	113	61	4	0
PA	9098	3338	180	4496	674	174	0	166	0	70	0
RI	738	391	3	222	61	24	2	16	8	7	4
SC	3196	754	67	2033	150	69	15	70	16	20	2
SD	969	466	25	292	49	22	83	11	5	10	6
TN	5077	2152	66	2081	242	110	200	89	119	18	0
TX	12551	7346	102	3192	843	85	329	264	311	67	12
UT	891	166	8	273	234	7	174	14	7	5	3
VT	237	127	13	72	19	2	1	3	0	0	0
VA	4464	1538	115	2085	303	73	254	37	25	28	6
WA	2387	1248	12	768	98	54	115	21	64	6	1
WV	2385	908	119	1249	47	19	0	29	5	8	1
WI	3771	1456	44	1575	515	57	61	22	24	13	4
WY	360	215	4	89	38	2	0	2	8	2	0

Source: calculated from U. S. Department of Education, Office of Special Education and Rehabilitative Services, Eighth Annual Report to Congress on the Implementation of the Education of the Handicapped Act, Table XXX, 1985.

Appendix C

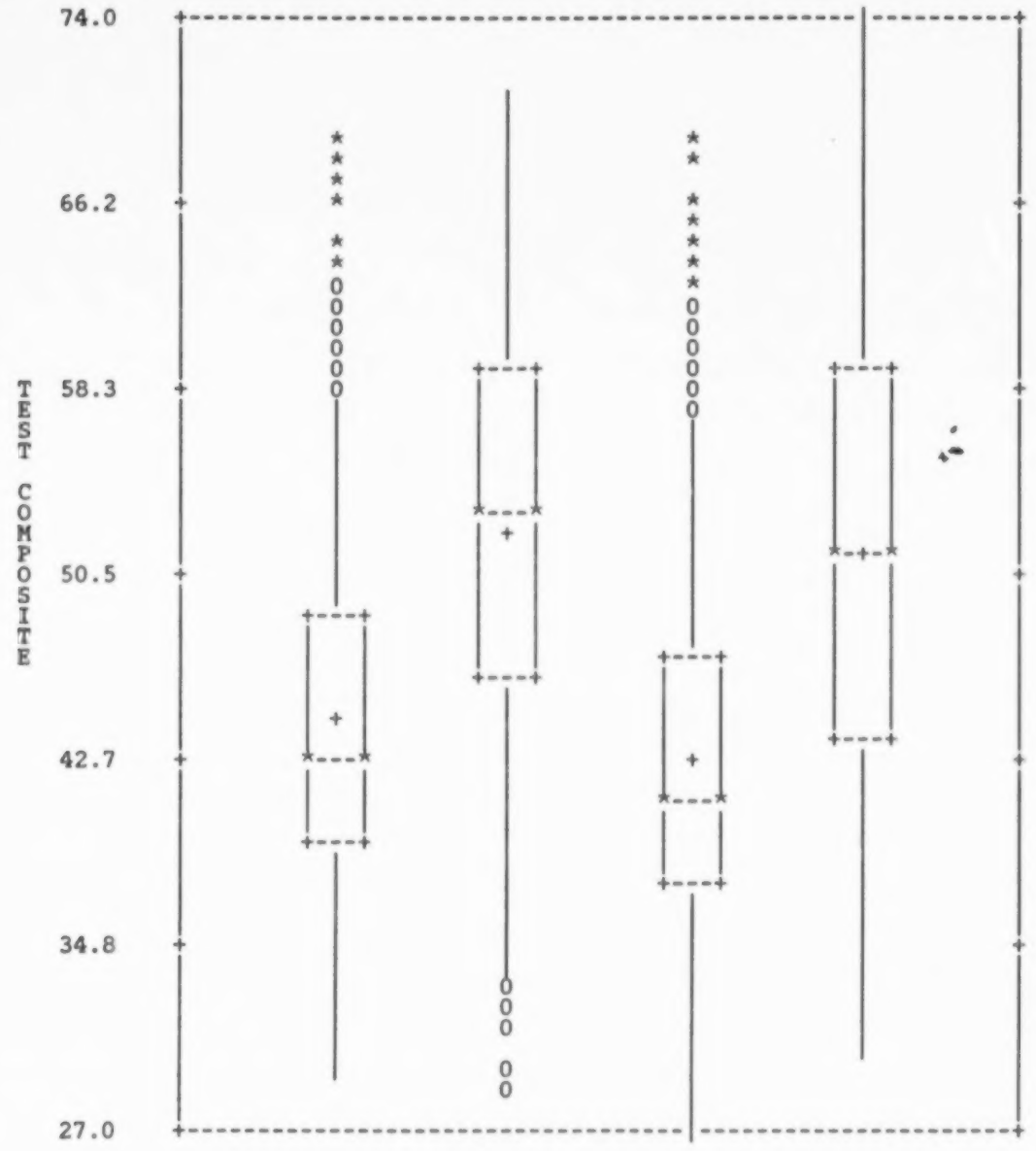
Box Plot Explanation

A boxplot, as illustrated below, provides information concerning the entire distribution of scores for the four groups of youth. Each boxplot consists of a rectangle with dotted lines extending vertically from the two ends. The horizontal line that forms the top of the box represents the 75th percentile for each group, the line that forms the bottom of the box represents the 25th percentile, and the horizontal line between the top and bottom of the box represents the 50th percentile (or median).

Please refer to the example of a boxplot for performance on the test composite from *High School and Beyond*. The vertical axis represents the range of test composite scores. In our example, the test composite has a mean score of 50. The horizontal axis depicts the four groups in the example.

First, focus on the middle of the distribution and note that the line inside the box represents the median for each of the groups. For example, the nonhandicapped dropouts had a median score of approximately 43; that is, half the nonhandicapped dropouts in the sample scored 43 or below and that half of them scored above 43 on the vertical axis. In contrast, the nonhandicapped graduates had a median score of 52.

Figure 22. Box Plot of Test Composite Score by Handicap and Graduation Status



Source: *High School and Beyond*, Second Follow-up of 1980 Sophomores

Next, for illustration purposes, look at the top of the nonhandicapped dropout boxplot and note that the 75th percentile score was approximately 48. Their graduate peers had a 75th percentile score of approximately 59.

Other information contained in the boxplot includes the plus sign ("+") which represents the mean score. The lines extending from the box represents the upper and lower 25% of the observations. The splitting of the distribution into four groups of 25% is often referred to as a quartile distribution. Thus the lower quartile would refer to the students scoring in the lower 25% of the distribution. Observations that are considered as outliers are represented on the display with a "0" (chance of occurring as 1 out of 20) and a " * " (chance of occurring as 1 out of 200). These outliers are based on the distributional attributes for the respective group.

Appendix D

Instructions for Sorting Items into Areas of Independent Living

We have selected items from the *High School and Beyond* questionnaires which seem to be appropriate to various areas of independent living. Please indicate which independent living area(s) are best represented in the item by circling the appropriate legends. If you think that an item is not appropriate then please indicate by circling NA; if it covers more than one area, circle all that apply; and if the item best fits an additional independent living area, please specify it under the other (OT) category. The respective independent living areas that are represented in this survey were taken from our recent transition literature review document and are outlined below:

AD = self-advocacy and skills: undertake self-advocacy, self-care and personal maintenance behaviors.

LA = living arrangements: live in accommodation with no, or limited, supervision by outsiders.

ET = employment/education training: seek and undertake competitive employment, training, or education.

MO = mobility and transportation: travel within the community using public or private means.

GS = generic services: use community services and facilities as any other member of the community.

LR = leisure and recreation: participate in community recreation and leisure activities.

CI = community interaction: interact with other members of the community on an equal basis.

Appendix E

Summary of Questions Included in Independent Living Scales

This appendix provides a summary of the questions used in the independent living scales. It includes: (a) the HSB variable names, (b) a brief description of the questions, (c) the response alternatives (and the HSB coding for them), (d) the obtained factor loadings, and (e) the identification of items that were reversed prior to scale construction (indicated by placing the letter "R" in front of the HSB variable name).

Self-Advocacy and Maintenance Skills Component

Factor loading		HSB variable name	Description
Factor I: Computer Skills			
.91		SY9A	**Have not used software packages.** *(1 = Yes, 2 = No)*
--.30	R	SY9B	**Have used statistical packages.** *(1 = Yes, 2 = No)*
--.49	R	SY9C	**Have used business packages.** *(1 = Yes, 2 = No)*
--.61	R	SY9D	**Have used word processing software.** *(1 = Yes, 2 = No)*
--.42	R	SY9E	**Have used data-base management systems.** *(1 = Yes, 2 = No)*
--.48	R	SY9F	**Have used instructional packages.** *(1 = Yes, 2 = No)*
.76		NEW2	**Never used a computer.**

			(1 = Yes, 2 = No)
--.79	R	NEW3	**Have used a computer.** *(1 = Yes, 2 = No)*

Factor II: Resource Utilization

.57	R	YB054A	**Do you know how to apply for an office job?** *(1 = Yes, 2 = Not sure, 3 = No)*
.40	R	YB054B	**Do you know how to make appointments with doctors?** *(1 = Yes, 2 = Not sure, 3 = No)*
.46	R	YB054C	**Do you know how to choose H.S. program for college?** *(1 = Yes, 2 = Not sure, 3 = No)*
.63	R	YB054D	**Do you know how to apply to college for admission?** *(1 = Yes, 2 = Not sure, 3 = No)*
.56	R	YB054E	**Do you know how to find out about different jobs?** *(1 = Yes, 2 = Not sure, 3 = No)*
.54	R	YB054F	**Do you know how to arrange bus/train/plane trips?** *(1 = Yes, 2 = Not sure, 3 = No)*

Factor III: Technological Skills

--.47		SY8A1	**Never used a pocket calculator.** *(1 = Yes, 2 = No)*
.49	R	NEW1	**Have used pocket calculators.** *(1 = Yes, 2 = No)*
--.82		NEW4	**Never used video tapes/video discs/cassette tapes.** *(1 = Yes, 2 = No)*
.87	R	NEW5	**Have used video tapes/video discs/cassette tapes.** *(1 = Yes, 2 = No)*

Factor IV: Life-Style Orientation

.40	BB057A	**Importance of success in work.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
.50	BB057B	**Importance of happy family life.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
.42	BB057D	**Importance of having strong friendships.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
.40	BB057E	**Importance of finding steady work.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
.37	BB057F	**Importance of being a leader in my community.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
.47	BB057G	**Importance of giving children better opportunities.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
.31	BB057H	**Importance of living close to parents and relatives.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
.45	BB057K	**Importance of having children.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
.34	BB057L	**Importance of having leisure time.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*

Factor V: Academic Organization

.66		YB016A	**How often do you forget paper or pencil?** *(1 = usually, 2 = fairly often, 3 = seldom, 4 = never)*
.67		YB016B	**How often do you forget books?** *(1 = usually, 2 = fairly often, 3 = seldom, 4 = never)*
.60		YB016C	**How often do you fail to complete homework?** *(1 = usually, 2 = fairly often, 3 = seldom, 4 = never)*
--.32	R	BB061E	**I like working hard in school.**

(1 = Yes, 2 = No)

Living Arrangements Component

Factor loading		HSB variable name	Description
Factor I: Financial Support			
–.50		**SY34A**	**Number of days lived with parents 1981.** *(0-365 days)*
.85	**R**	**SY35A81**	**Did parents provide room 1981?** *(1 = Yes, 2 = No)*
.83	**R**	**SY35B81**	**Did parents provide board 1981?** *(1 = Yes, 2 = No)*
–.76		**SY35F81**	**Parents did not provide major forms of aid 1981.** *(1 = Yes, 2 = No)*
.76	**R**	**SY35A82**	**Did parents provide room 1982?** *(1 = Yes, 2 = No)*
.74	**R**	**SY35B82**	**Did parents provide board 1982?** *(1 = Yes, 2 = No)*
–.75		**SY35F82**	**Parents did not provide major forms of aid 1982.** *(1 = Yes, 2 = No)*
.45	**R**	**SY35A83**	**Did parents provide room 1983?** *(1 = Yes, 2 = No)*
.43	**R**	**SY35B83**	**Did parents provide board 1983?** *(1 = Yes, 2 = No)*
–.48		**SY35F83**	**Parents did not provide major forms of aid 1983.** *(1 = Yes, 2 = No)*
Factor II: Household Composition			
.77		**SY4B**	**Lived with father 2/84.** *(1 = Yes, 2 = No)*
.90		**SY4D**	**Lived with mother 2/84.** *(1 = Yes, 2 = No)*
.63		**SY4F**	**Lived with siblings 2/84.** *(1 = Yes, 2 = No)*
–.63	**R**	**SY4K**	**Lived with nonrelatives 2/84.** *(1 = Yes, 2 = No)*
.72		**SY7**	**How far away are you from your H.S. community?** *(1 = Same place, 2 = less than 50 mi., 3 = 50-99 mi., 4 = 100-199 mi., 5 = 200-499 mi., 6 = 500 mi. or more)*
.72		**SY16**	**Were did you live 2/84?** *(1 = Private house, 2 = Mobile home, 3 = Private apt., 4 = dorm or school housing, 5 = fraternity or sorority house, 6 = Boarding house, 7 = Military barracks, 8 = Other)*
–.52	**R**	**SY34B**	**Number of days lived with parents 1982.** *(0-365 days)*
–.81	**R**	**SY34C**	**Number of days lived with parents 1983.** *(0-365 days)*

Factor III: Tax Exemption

.90	R	SY37A	**Parents claimed you as tax exemption 1981.** *(1 = Yes, 2 = No, 3 = Don't know)*
.93	R	SY37B	**Parents claimed you as tax exemption 1982.** *(1 = Yes, 2 = No, 3 = Don't know)*
.89	R	SY37C	**Parents claimed you as tax exemption 1983.** *(1 = Yes, 2 = No, 3 = Don't know)*
.71	R	SY37D	**Parents will claim you as tax exemption 1984.** *(1 = Yes, 2 = No, 3 = Don't know)*

Factor IV: Adult Milestones

.67	FY97A	**At what age do you expect to get married?** *(1 = Don't expect to do this, 2 = already done it, 3 = under 18, 4-15 = 18-29, 16 = 30 or more)*
.59	FY97B	**At what age do you expect to have first child?** *(1 = Don't expect to do this, 2 = already done it, 3 = under 18, 4-15 = 18-29, 16 = 30 or more)*
.54	FY97C	**At what age do you expect to start 1st regular job?** *(1 = Don't expect to do this, 2 = already done it, 3 = under 18, 4-15 = 18-29, 16 = 30 or more)*
.57	FY97D	**At what age do you expect to live in own home or apt.?** *(1 = Don't expect to do this, 2 = already done it, 3 = under 18, 4-15 = 18-29, 16 = 30 or more)*
.50	FY97E	**At what age do you expect to finish full time educ.?** *(1 = Don't expect to do this, 2 = already done it, 3 = under 18, 4-15 = 18-29, 16 = 30 or more)*

Community Integration Component

Factor loading	HSB variable name	Description

Factor I: Group Participation

.33	FY38P	**Participated in service clubs.** *(1 = Not participated, 2 = Participated, 3 = Leader)*
.55	FY39A	**How often have you spoken before 50 or more people?** *(1 = Never, 2 = Once, 3 = A few times, 4 = Often)*
.60	FY39B	**How often have you helped plan a large social event?** *(1 = Never, 2 = Once, 3 = A few times, 4 = Often)*
.62	FY39C	**How often have you debated an issue in a group?** *(1 = Never, 2 = Once, 3 = A few times, 4 = Often)*
.59	FY39D	**How often have you worked with group on a project?** *(1 = Never, 2 = Once, 3 = A few times, 4 = Often)*
.66	FY39E	**How often have you headed group in problem-solving.** *(1 = Never, 2 = Once, 3 = A few times, 4 = Often)*
.61	FY39F	**How often have you chaired a meeting?** *(1 = Never, 2 = Once, 3 = A few times, 4 = Often)*

Factor II: Social Roles

.71	R	YB053A	Do others see you as popular? *(1 = very, 2 = Somewhat, 3 = Not at all)*
.41	R	YB053B	Do others see you as athletic? *(1 = very, 2 = Somewhat, 3 = Not at all)*
.56	R	YB053C	Do others see you as socially active? *(1 = very, 2 = Somewhat, 3 = Not at all)*
.42	R	YB053D	Do others see you as a good student? *(1 = very, 2 = Somewhat, 3 = Not at all)*
.72	R	YB053E	Do others see you as important? *(1 = very, 2 = Somewhat, 3 = Not at all)*
.54	R	YB053G	Do others see you as part of the leading crowd? *(1 = very, 2 = Somewhat, 3 = Not at all)*

Factor III: Social Activities

.44		BB047A	How often do you visit with friends? *(1 = rarely or never, 2 = less than once a week, 3 = 1-2 times a week, 4 = about every day)*
.72		BB047C	How often do you go out on dates? *(1 = rarely or never, 2 = less than once a week, 3 = 1-2 times a week, 4 = about every day)*
.56		BB047D	How often do you just drive around? *(1 = rarely or never, 2 = less than once a week, 3 = 1-2 times a week, 4 = about every day)*
.40		BB047E	How often do you talk with friends on the phone? *(1 = rarely or never, 2 = less than once a week, 3 = 1-2 times a week, 4 = about every day)*
−.48	R	YB079	Are you dating regularly, going steady, engaged? *(1 = Yes, 2 = No)*

Factor IV: Church Participation

.69		BB032N	Participated in church activities. *(1 = Have not participated, 2 = Participated)*
−.51	R	BB092	How often attended religious services? *(1 = More than once a week, 2 = once a week, 3 = 2-3 times a month, 4 = once a month, 5 = several times a year, 6 = not at all)*
.65		FY38N	Participated in church activities. *(1 = Not participated, 2 = Participated, 3 = Leader)*

Leisure and Recreation Component

Factor loading	HSB variable name	Description

Factor I: Extracurricular Clubs

.33	BB032C	Participated in cheer leaders, pep club, majorettes. *(1 = Have not participated, 2 = Participated)*
.41	BB032D	Participated in debating or drama. *(1 = Have not participated, 2 = Participated)*
.41	BB032F	Participated in chorus or dance. *(1 = Have not participated, 2 = Participated)*
.36	FY38C	Participated in cheer leaders, pep club, majorettes. *(1 = Not participated, 2 = Participated, 3 = Leader)*

.46		FY38D	**Participated in debating or drama.** *(1 = Not participated, 2 = Participated, 3 = Leader)*
.47		FY38F	**Participated in chorus or dance.** *(1 = Not participated, 2 = Participated, 3 = Leader)*
.38		FY38H	**Participated in honorary clubs.** *(1 = Not participated, 2 = Participated, 3 = Leader)*
.42		FY38I	**Participated in school newspaper, yearbook, etc.** *(1 = Not participated, 2 = Participated, 3 = Leader)*
.34		FY38J	**Participated in school subject-matter clubs.** *(1 = Not participated, 2 = Participated, 3 = Leader)*
.41		FY38K	**Participated in student government, political clubs.** *(1 = Not participated, 2 = Participated, 3 = Leader)*

Factor II: Extracurricular Sports

.63		BB032B	**Participated on athletic teams.** *(1 = Have not participated, 2 = Participated)*
.72		FY38A	**Participated on varsity athletic teams.** *(1 = Not participated, 2 = Participated, 3 = Leader)*
.61		FY38B	**Participated on other athletic teams.** *(1 = Not participated, 2 = Participated, 3 = Leader)*

Education, Training, and Employment Component

Factor loading		HSB variable name	Description

Factor I: Work Experience

.96	R	BB024A	**Have not worked for pay.** *(0 = No, 1 = Yes)*
--.77		BB025	**Is current job government sponsored or private?** *(1 = Have not worked, 2 = CETA, 3 = Other gov't job, 4 = Private, 5 = Other, 6 = Don't know)*
--.50		BB026	**How much on the job training?** *(1 = Have not worked, 2 = almost none, 3 = less than 1/4 time, 4 = 1/4 time, 5 = 1/2 time, 6 = more than 1/2 time)*
.76	R	BB027A	**Do people goof off where you work?** *(1 = Yes, 2 = No, 3 = Never worked)*
.75	R	BB027B	**Do you work just for the money?** *(1 = Yes, 2 = No, 3 = Never worked)*
.76	R	BB027C	**Is your work more enjoyable than school?** *(1 = Yes, 2 = No, 3 = Never worked)*
.80	R	BB027D	**Does your job encourage good work habits?** *(1 = Yes, 2 = No, 3 = Never worked)*
.84	R	BB027E	**Is your job more important than school?** *(1 = Yes, 2 = No, 3 = Never worked)*

Factor II: Career Expectations

.30	R	BB062D	**Expect to be homemaker (only) at age 30.** *(0 = No, 1 = Yes)*
.68	R	BB065B	**Do not expect to go beyond high school graduation.** *(0 = No, 1 = Yes)*
.46	R	BB071A	**Expect to work full time the year after H.S.** *(0 = No, 1 = Yes)*
.28	R	BB072D	**Will you be a homemaker the year after H.S.?** *(0 = No, 1 = Yes)*

--.47		FY97C	**At what age do you expect to start a regular job?** *(1 = Don't expect to do this, 2 = already done it, 3 = under 18, 4-15 = 18-29, 16 = 30 or more)*
--.57		FY97E	**At what age do you expect to finish education?** *(1 = Don't expect to do this, 2 = already done it, 3 = under 18, 4-15 = 18-29, 16 = 30 or more)*
.56	R	SY3C	**Were you taking college courses 2/84?** *(1 = Yes, 2 = No)*
--.30		SY3G	**Were you keeping house (no other job) 2/84?** *(1 = Yes, 2 = No)*
.56	R	SY13B	**Do not expect to go beyond high school graduation.** *(0 = No, 1 = Yes)*
.59	R	SY15	**Attend postsecondary school before 2/84?** *(1 = Yes, 2 = No)*
--.29		SY55	**Were you unemployed and job hunting 6/82--2/84?** *(1 = Yes, 2 = No)*

Factor III: Post-Secondary Education

.47	R	BB065D	**Expect at least 2 years of vocational school.** *(0 = No, 1 = Yes)*
.46	R	BB071E	**Expect to take vocational courses after H.S.** *(0 = No, 1 = Yes)*
--.43		BB071H	**Expect to attend four-year college after H.S.** *(0 = No, 1 = Yes)*
.50	R	BB072E	**Expect to take vocational courses after H.S.** *(0 = No, 1 = Yes)*
--.32		BB072H	**Expect to attend four-year college after H.S.** *(0 = No, 1 = Yes)*

Factor IV: Involvement in Special Programs

.35	BB014C	**Knowledge of or involvement in Talent Search?** *(1 = No knowledge, 2 = Heard of it, 3 = Participated)*
.29	BB014D	**Knowledge of or involvement in Upward Bound?** *(1 = No knowledge, 2 = Heard of it, 3 = Participated)*
.40	BB014E	**Knowledge of or involvement in Continuation H.S.?** *(1 = No knowledge, 2 = Heard of it, 3 = Participated)*
.40	BB014F	**Knowledge of or involvement in Alternative H.S.?** *(1 = No knowledge, 2 = Heard of it, 3 = Participated)*
.37	BB014G	**Knowledge of or involvement in H.S. for pregnant girls?** *(1 = No knowledge, 2 = Heard of it, 3 = Participated)*

Factor analysis was not conducted on the two remaining components of independent living: the mobility and transportation component and the generic services component. The former consists of only three variables; the latter consists of catagorical variables. Neither set of variables meets the criteria associated with the use of factor analysis; they were analyzed using nonparametric procedures as described in Chapter 5. The summary of the questions in these components includes: (a) the HSB variable names, (b) a brief description of the questions, and (c) the response alternatives (with HSB coding for them).

Mobility and Transportation Component

HSB variable name	Description
BB057H	**Importance of living close to parents and relatives.** *(1 = Not important, 2 = Somewhat important, 3 = Very important)*
BB057I	**Importance of moving from this area of the country.** *(1 = not important, 2 = somewhat important, 3 = very important)*
FY79	**Would be willing to move from town to get job.** *(1 = yes, prefer to move, 2 = yes, don't care, 3 = yes, but prefer to stay, 4 = not willing to move)*

Generic Services Component

HSB variable name	Description
YB054E	**Know how to find out about different kinds of jobs?** *(1 = yes, 2 = not sure, 3 = no)*
YB054F	**Know how to arrange a trip out of town?** *(1 = yes, 2 = not sure, 3 = no)*
FY23AA	**Did nothing to look for work last week.** *(1 = yes, 2 = no)*
FY23AB1	**Checked with state employment agency last week.** *(1 = yes, 2 = no)*
FY23AB2	**Checked with private employment agency last week.** *(1 = yes, 2 = no)*
FY23AB3	**Checked with military recruiter last week.** *(1 = yes, 2 = no)*
FY23AB4	**Checked with employer directly last week.** *(1 = yes, 2 = no)*
FY23AB5	**Checked with friends/relatives last week for jobs.** *(1 = yes, 2 = no)*
FY23AC	**Placed or answered ads to look for a job last week.** *(1 = yes, 2 = no)*
FY23AD	**Looked in newspaper to look for a job last week.** *(1 = yes, 2 = no)*
FY23AE	**Used school employment service to look for a job.** *(1 = yes, 2 = no)*
FY23AF	**Used other method to look for a job last week.** *(1 = yes, 2 = no)*
SY46J	**How did you find the first job?** *(1 = school emp. serv., 2 = public emp. serv., 3 = private emp. agency, 4 = newspaper ad, 5 = checked with employer, 6 = through a relative, 7 = through a friend, 8 = civil service application, 9 = other, 10 = union registration)*

Appendix F

Measures Under Study

This section contains the variables examined in Chapters 5 and 6 of the *Digest*. All variables are derived from the HSB second follow-up data file, unless otherwise specified. Information regarding the coding scheme was taken from the *High School and Beyond 1980 Sophomore Cohort Second Follow-up (1984) Data File User's Manual* –Appendices G and C.1. Analyses were performed using the Statistical Analysis System (SAS) and the Statistical Package for the Social Sciences X ($SPSS^X$) packages installed on the IBM Virtual Machine/Converstional Monitor System (VM/CMS) at the University of Illinois on the Urbana-Champaign campus.

Background Variables

The four background measures are socioeconomic status (SES), sex (SEX), race/ethnicity (RACE), and handicap status (NNHAND).

SES

SES is a continuous composite score for socioeconomic status copied from the first follow-up SES composite variable (if missing, base year SES was used). This composite has five components, standardized to a mean of zero and a standard deviation of one. The com-

posite score is the average of all nonmissing component scores. The components are father's occupation (coded in the metric of the Duncan SEI),[1] father's and mother's education, family income, and a standardized eight-item household possession scale. SES was also available in quartile coding with cut-off points at -0.59, -0.12, and +0.45.

Sex

This variable is coded: 1 - male, and 2 - female.

Race/Ethnicity

This is a nominal variable based on race and ethnic origin codes which were available from both base year and first follow-up questionnaires consisting of: 1 - Hispanic, 2 - American Indian, 3 - Asian, 4 - Black, and 5 - White.

Type of Handicap

This consists of two variables. One variable identifies youth with and without handicaps. The other variable represents those youth who identified themselves as having one of the five selected specific handicapping conditions.[2] The first group is derived from the NCES developed composite variable HANDICAP and denotes whether the respondents ever identified themselves as having a handicap, participated in a program for persons with handicaps, or received Division of Vocational Rehabilitation benefits. In our case, the new coding is as follows:

```
IF HANDICAP=4 THEN NHAND=0;
   ELSE IF HANDICAP=1 OR HANDICAP=2 OR HANDICAP=3 THEN NHAND=1;
   ELSE NHAND=.;

NUMHCC=SUM (OF LD HP SI OH HI);

IF NHAND=1 OR NUMHCC GT 0 OR PC=1 OR PH=1 OR SP=1 THEN NNHAND=1;
   ELSE IF NHAND=. AND NUMHCC=. AND PC=. AND PH=. AND SP=.
                                        THEN NNHAND=.;
   ELSE NNHAND=0;
```

In addition, HSB includes categories of specific handicapping conditions: learning disabilities (LD), visual handicaps (VH), hard of hearing (HH), deafness (DF), speech impairments (SI), orthopedic handicaps (OH), and other health impairments (HI). These groups are derived

from combining the base-year and first follow-up variables. In our case the coding is as follows:

```
 * RECODE YES (2) TO NO (0);
ARRAY L FY103A FY103B FY103C FY103D FY103E FY103F FY103G;
   DO OVER L; IF L=2 THEN L=0; END;

 * RECODE NO (1) TO 0 AND YES (2) TO 1;
ARRAY M BB011H BB011I FY9H FY9I FY104 BB088;
   DO OVER M; M=M-1; IF M GT 1 THEN M=.; END;

IF BB087A=1 OR FY103A=1 THEN LD=1;
   ELSE IF BB087A=. AND FY103A=. THEN LD=.;
   ELSE LD=0;

IF BB087B=1 OR FY103B=1 THEN VH=1;
   ELSE IF BB087B=. AND FY103B=. THEN VH=.;
   ELSE VH=0;

IF BB087C=1 OR FY103C=1 THEN HH=1;
   ELSE IF BB087C=. AND FY103C=. THEN HH=.;
   ELSE HH=0;

IF BB087D=1 OR FY103D=1 THEN DF=1;
   ELSE IF BB087D=. AND FY103D=. THEN DF=.;
   ELSE DF=0;

IF BB087E=1 OR FY103E=1 THEN SI=1;
   ELSE IF BB087E=. AND FY103E=. THEN SI=.;
   ELSE SI=0;

IF BB087F=1 OR FY103F=1 THEN OH=1;
   ELSE IF BB087F=. AND FY103F=. THEN OH=.;
   ELSE OH=0;

IF BB087G=1 OR FY103G=1 THEN HI=1;
   ELSE IF BB087G=. AND FY103G=. THEN HI=.;
   ELSE HI=0;

IF BB088=1 OR FY104=1 THEN PC=1;
   ELSE IF BB088=. AND FY104=. THEN PC=.;
   ELSE PC=0;

IF BB011H=1 OR FY9H=1 THEN SP=1;
   ELSE IF BB011H=. AND FY9H=. THEN SP=.;
   ELSE SP=0;

IF BB011I=1 OR FY9I=1 THEN PH=1;
   ELSE IF BB011I=. AND FY9I=. THEN PH=.;
   ELSE PH=0;
```

Further refinements to these variables included collapsing hard of hearing (HH) and deafness (DF) into one variable entitled hearing impairments (HP).

```
IF DF=1 OR HH=1 THEN HP=1;
   ELSE IF DF=. AND HH=. THEN HP=.;
   ELSE HP=0;
```

One other modification to the variables was the inclusion of those respondents that identified only one handicapping condition. Students with multiple handicaps were not included in analyses. The variable was transformed in the following manner:

```
COMBO=0;
IF LD=1 THEN IF SI=1 THEN COMBO=1;
                ELSE IF OH=1 THEN COMBO=1;
                ELSE IF HI=1 THEN COMBO=1;
                ELSE IF HP=1 THEN COMBO=1;
   ELSE IF SI=1 THEN IF OH=1 THEN COMBO=1;
                ELSE IF HI=1 THEN COMBO=1;
                ELSE IF HP=1 THEN COMBO=1;
   ELSE IF OH=1 THEN IF HI=1 THEN COMBO=1;
                ELSE IF HP=1 THEN COMBO=1;
   ELSE IF HI=1 THEN IF HP=1 THEN COMBO=1;

IF COMBO NE 1 AND LD=1 THEN SPEC=1;
   ELSE IF COMBO NE 1 AND HP=1 THEN SPEC=2;
   ELSE IF COMBO NE 1 AND SI=1 THEN SPEC=3;
   ELSE IF COMBO NE 1 AND OH=1 THEN SPEC=4;
   ELSE IF COMBO NE 1 AND HI=1 THEN SPEC=5;
   ELSE SPEC=.;
```

Finally, a measure of self-concept was included. The variable was transformed as follows:

```
FYCONCPT=-FYCONCPT;
```

Contextual Variables

This group consists of four coded variables: community type (HSURBAN), type of high school program (HSPROG), high school type (HSTYPE), and high school graduation status (HSGRAD).

Community Type

According to NCES, persons were assigned to one of three categories based on the location of the school they attended in the base-year survey: 1 - urban (located in the central city of a standard metropolitan statistical area (SMSA)), 2 - suburban (located outside of a central city SMSA), and 3 - rural (not located in a SMSA).

Type of Program

HSPROG is a composite variable created from BB002 (high school program indicated during the base year), FD9 (program at the time the student dropped out of school), and FY2 (high school program at the time of the first follow-up). In the event that responses on these variables were inconsistent, a preference hierarchy was invoked. If respondents reported being in academic programs on any one of these variables, then HSPROG received the value for the academic condition. Vocational programs were next in the hierarchy. If an academic program was not indicated and a vocational program was listed at least once, then HSPROG was given the value for the vocational condition. If neither academic nor vocational programs were indicated and a general program was reported, then the value for the general condition was used. If none of these three types of programs were listed, then HSPROG was declared missing. The code for HSPROG is as follows: 1 - general education, 2 - academic, and 3 - vocational/technical education.

Type of Post-Secondary School Experience

The variable PSESFE84 was created by NCES as an eight level variable to describe full-time and part-time participation in private and public two- and four-year institutions. A new variable, NEWPSE was created for this study to collapse PSESFE84 into three levels:

```
IF PSESFE84 GT 1 AND PSESFE84 LE 4 THEN NEWPSE=1;
   ELSE IF PSESFE84 GT 4 THEN NEWPSE=2;
   ELSE NEWPSE=0;
```

A series of variables were used to determine if the respondents sought post-secondary education, got jobs, or became homemakers after leaving high school.

```
IF SY13 = . THEN SSY13B = .;
   ELSE IF SY13 = 2 THEN SSY13B = 1;
   ELSE SSY13B = 0;
IF BB062 = . THEN SBB062D = .;
   ELSE IF BB062 = 4 THEN SBB062D = 1;
   ELSE SBB062D = 0;
IF BB065 = . THEN SBB065B = .;
   ELSE IF BB065 = 2 THEN SBB065B = 1;
   ELSE SBB065B = 0;
IF BB071 = . THEN SBB071A = .;
   ELSE IF BB071 = 1 THEN SBB071A = 1;
   ELSE SBB071A = 0;
IF BB065 = . THEN SBB065D = .;
   ELSE IF BB065 = 4 THEN SBB065D = 1;
   ELSE SBB065D = 0;
```

```
IF BB071 = . THEN SBB071E = .;
   ELSE IF BB071 = 5 THEN SBB071E = 1;
   ELSE SBB071E = 0;
IF BB071 = . THEN SBB071H = .;
   ELSE IF BB071 = 8 THEN SBB071H = 1;
   ELSE SBB071H = 0;
```

Type of High School

HSTYPE is a nominal variable that describes the respondent's original high school sample type: regular sample, alternative public, Cuban Hispanic public, and other Hispanic public were collapsed into public (HSTYPE = 1). Regular Catholic, Black Catholic, and Cuban Hispanic Catholic high schools were collapsed with elite private and other private (HSTYPE = 2).

High School Graduation Status

This is determined from HSDIPLOM. For the purposes of this study, the original variable HSDIPLOM was collapsed to the new variable HSGRAD, a dichotomous variable (0 - dropout or 1 - graduate), as shown below:

```
IF HSDIPLOM GE 2 THEN HSGRAD=0;
   ELSE IF HSDIPLOM=1 THEN HSGRAD=1;
   ELSE HSGRAD=.;
```

School Achievement Variable

A number of measures of performance were used, including a composite test score (TEST), high school grade point average (HSGPA), hours spent on homework per week (HSHOMEWK), and a composite of standardized scores related to two levels of mathematics skills (FYMTHSD).

Test

This continuous variable is an equally weighted linear composite of formula scores on standardized vocabulary (FYVOCBSD), reading (FYREADSD), and mathematics tests (FYMTH1SD), each scored with a mean of 50 and a standard deviation of 10. This variable was copied from the first follow-up file (FUTEST). Values greater than 990 were set to missing.

```
IF FUTEST GE 990 THEN FUTEST=.;
```

If FUTEST was missing, BYTEST was copied. There is also a nominal version for this variable, TESTQ which reflects the scores in quartiles. Cut-points were 42.57, 49.61, and 57.06.

High School Grade Point Average

Grade point average was computed from courses, credits, and grades shown on the high school transcript obtained as part of the 1982 *High School and Beyond Transcript Survey*. HSGPA is a continuous variable that is based on a four-point scale.

Hours Spent on Homework Per Week

This is a nominal variable (BB015) that describes the respondents' choices of the categories: 1 - light to one hour, 2 - one to five hours, and 3 - five hours or more.

Standardized Mathematics Scores

FYMTHSD is a composite variable based on standardized scores for two levels of mathematics, as indicated below:

```
FYMTHSD=(FYMTH1SD + FYMTH2SD)/2;
```

Courses Taken and Other Specific Training

The number of courses taken was assessed using two composite variables, each summing across the various types of courses that could be taken.

```
CRSTK80 = SUM (OF YB006A YB006B YB006C YB006D YB006E YB006F
                  YB006G YB006H YB006I YB006J YB006K);
```

```
CRSTK82 = SUM (OF FY4A FY4B FY4C FY4D FY4E FY4F FY4G FY4H FY4I
                  FY4J FY4K FY4L);
```

Other specific training (i.e., the amount of exposure to computers and other electronic equipment) was measured using the following five composite variables.

```
* SNEW1 = Have used pocket calculators;
  SNEW1 = (SY8A2 + SY8A3+ SY8A4) /3;

* SNEW2 = Never used a computer;
  SNEW2 = (SY8B1 + SY8C1 + SY8D1 + SY8E1 + SY8I1) /5;

* SNEW3 = Have used a computer;
  SNEW3 = (SY8B2 + SY8B3 + SY8B4
           + SY8C2 + SY8C3 + SY8C4
           + SY8D2 + SY8D3 + SY8D4
           + SY8E2 + SY8E3 + SY8E4
           + SY8I2 + SY8I3 + SY8I4) / 15;

* SNEW4 = Never used video tapes/video discs/cassette tapes;
  SNEW4 = (SY8F1 + SY8G1 + SY8H1) /3;

* Have used video tapes/video discs/cassette tapes;
  SNEW5 = (SY8F2 + SY8F3 + SY8F4
           + SY8G2 + SY8G3 + SY8G4
           + SY8H2 + SY8H3 + SY8H4) /9;
```

Labor Market Variables

Labor Force Participation

This refers to the respondent's employment status as of February 1984, and it is based on the NCES variable JOBSFE84. This is a four-level variable with categories of: 1 - full-time job, 2 - part-time job, 3 - unemployed, and 4 - not in the labor force.

Income Earned

This information is determined from their first job after high school on an hourly basis. This was determined by examining question SY46GA (first job) and transforming the figure to a per-hour value by using the following coding scheme:

```
ARRAY C SY46GA SY47GA SY48GA SY49GA;
     DO OVER C; IF C GE 99990 THEN C=.; END;
```

```
ARRAY D SY46GB SY46HB SY47GB SY47HB SY48GB SY48HB SY49GB SY49HB;
     DO OVER D; IF D GT 6 THEN D=.; END;

IF SY46GB = 5 THEN HRPAY1 = (SY46GA/48) / (SY46I);
   ELSE IF SY46GB = 4 THEN HRPAY1 = (SY46GA/4) / (SY46I);
   ELSE IF SY46GB = 3 THEN HRPAY1 = (SY46GA/2) / (SY46I);
   ELSE IF SY46GB = 2 THEN HRPAY1 = (SY46GA/1) / (SY46I);
   ELSE IF SY46GB = 1 THEN HRPAY1 = SY46GA;
   ELSE HRPAY1=.;

   ARRAY G1 SY46GA SY47GA SY48GA SY49GA;
   ARRAY H1 SY46GB SY47GB SY48GB SY49GB;
   ARRAY I1 MON1MTH MON2MTH MON3MTH MON4MTH;
   DO OVER H1;
      IF H1=1 THEN I1=160*G1;
         ELSE IF H1=2 THEN I1=  4*G1;
         ELSE IF H1=3 THEN I1=  2*G1;
         ELSE IF H1=4 THEN I1=  1*G1;
         ELSE IF H1=5 THEN I1=  G1/12;
         ELSE IF H1=6 THEN I1=  0;
      END;
```

Hours Worked Per Week

This is derived using the information from the first job after high school as determined by question SY46I (first job). This continuous variable ranges from 0 to 91 hours. Values reported over 91 were designated as missing. This was accomplished using the following coding.

```
ARRAY F SY46I SY47I SY48I SY49I;
   DO OVER F; IF F GT 91 THEN F=.; END;
```

Duration of Employment

Duration of employment is determined by calculating the length of employment in the first job, questions SY46E and SY46F, using the following formula:

```
ARRAY A SY46FM SY47FM SY48FM SY49FM SY46EM SY47EM SY48EM SY49EM;
     DO OVER A; IF A GT 12 THEN A=.; END;
ARRAY B SY46FY SY47FY SY48FY SY49FY SY46EY SY47EY SY48EY SY49EY;
     DO OVER B; IF B GT 84 THEN B=.; END;
ARRAY A1 SY46F SY47F SY48F SY49F;
ARRAY B1 SY46FY SY47FY SY48FY SY49FY;
ARRAY C1 SY46FM SY47FM SY48FM SY49FM;
ARRAY D1 SY46EY SY47EY SY48EY SY49EY;
ARRAY E1 SY46EM SY47EM SY48EM SY49EM;
ARRAY F1 EMPTIME1 EMPTIME2 EMPTIME3 EMPTIME4;
DO OVER A1;
   IF A1=2 THEN F1=(B1+C1/12)-(D1+E1/12);
      ELSE IF A1=1 THEN F1=(84+4/12)-(D1+E1/12);
   END;
```

```
TOTEMP=EMPTIME1+EMPTIME2+EMPTIME3+EMPTIME4;
```

First Job Classification

NCES classifies SY46A (first job), SY47A (second job), SY48A (third job), and SY49A (fourth job) according to the following classification scheme:[3]

```
ARRAY J SY46A SY47A SY48A SY49A SY46B SY47B SY48B SY49B;
ARRAY K OCC1 OCC2 OCC3 OCC4  IND1 IND2 IND3 IND4;
   DO OVER J;
      IF 001 LE J LE 196 THEN K=1;          /*PROFESSIONAL*/
         ELSE IF 201 LE J LE 246 THEN K=2;  /*MANAGER*/
         ELSE IF 260 LE J LE 296 THEN K=3;  /*SALES*/
         ELSE IF 301 LE J LE 396 THEN K=4;  /*CLERICAL*/
         ELSE IF 401 LE J LE 586 THEN K=5;  /*CRAFTS*/
         ELSE IF 601 LE J LE 696 THEN K=6;  /*OPERATIVES*/
         ELSE IF 701 LE J LE 726 THEN K=7;  /*TRANS OPERATIVES*/
         ELSE IF 740 LE J LE 796 THEN K=8;  /*NON-FARM LABOR*/
         ELSE IF 801 LE J LE 806 THEN K=9;  /*FARMERS*/
         ELSE IF 821 LE J LE 846 THEN K=10; /*FARM LABORS*/
         ELSE IF 901 LE J LE 976 THEN K=11; /*SERVICE WORKERS*/
         ELSE IF 980 LE J LE 986 THEN K=12; /*PRIVATE HOUSEHOLD*/
         ELSE IF J GT 986 THEN K=.;
      END;
```

Whether or not the respondent had worked for pay was assessed using variable BB024 as follows:

```
IF BB024 EQ . THEN SBB024A = .;
   ELSE IF BB024 EQ 1 THEN SBB024A = 1;
   ELSE SBB024A = 0;
```

Method of Finding the First Job

The following classification scheme was used to identify the approach taken in obtaining the first job.

```
IF SY46J = . THEN J1 = .;
   ELSE IF SY46J = 1 THEN J1 = 1;
   ELSE J1 = 0;

IF SY46J = . THEN J2 = .;
   ELSE IF SY46J = 2 THEN J2 = 1;
   ELSE J2 = 0;

IF SY46J = . THEN J3 = .;
   ELSE IF SY46J = 3 THEN J3 = 1;
   ELSE J3 = 0;

IF SY46J = . THEN J4 = .;
```

```
   ELSE IF SY46J = 4 THEN J4 = 1;
   ELSE J4 = 0;

IF SY46J = . THEN J5 = .;
   ELSE IF SY46J = 5 THEN J5 = 1;
   ELSE J5 = 0;

IF SY46J = . THEN J6 = .;
   ELSE IF SY46J = 6 THEN J6 = 1;
   ELSE J6 = 0;

IF SY46J = . THEN J7 = .;
   ELSE IF SY46J = 7 THEN J7 = 1;
   ELSE J7 = 0;

IF SY46J = . THEN J8 = .;
   ELSE IF SY46J = 8 THEN J8 = 1;
   ELSE J8 = 0;

IF SY46J = . THEN J9 = .;
   ELSE IF SY46J = 9 THEN J9 = 1;
   ELSE J9 = 0;

IF SY46J = . THEN J10 = .;
   ELSE IF SY46J = 10 THEN J10 = 1;
   ELSE J10 = 0;
```

Transformations of Other Variables

Handling of Extreme Values

Variables that had distributions with values that were judged to be extreme were modified in a number of ways. Variables representing the number of days spent living with parents were modified such that values greater than 365 were set to missing.

```
IF SY34A GT 365 THEN SY34A = .;
IF SY34B GT 365 THEN SY34B = .;
IF SY34C GT 365 THEN SY34C = .;
```

Other variables are handled as follows:

```
IF SY16 GT 8 THEN SY16 = .;

   ARRAY E SY46HA SY47HA SY48HA SY49HA;
        DO OVER E; IF E GE 90000 THEN E=.; END;

   ARRAY G SY46J SY47J SY48J SY49J;
        DO OVER G; IF G GT 10 THEN G=.; END;

   ARRAY H SY46K SY47K SY48K SY49K;
        DO OVER H; IF H GT 8 THEN H=.; END;

   ARRAY I SY46LA SY47LA SY48LA SY49LA;
```

```
     DO OVER I; IF I GT 91 THEN I=.; END;

ARRAY N FY4A FY4B FY4C FY4D FY4E FY4F FY4G FY4H FY4I FY4J FY4K FY4L;
     DO OVER N; IF N GT 8 THEN N=.; END;

ARRAY O YB006A YB006B YB006C YB006D YB006E YB006F YB006G
        YB006H YB006I YB006J YB006K;
     DO OVER O; IF O GT 4 THEN O=.; END;

ARRAY P YB114BK FY128BK;
     DO OVER P; IF P GT 3 THEN P=.; END;

IF SY39 NE . AND SY39AA GT 2 THEN SY39AA =.;
IF SY39 NE . AND SY39AB GT 2 THEN SY39AB =.;
IF SY39 NE . AND SY39AC GT 2 THEN SY39AC =.;
IF SY39 NE . AND SY39AD GT 2 THEN SY39AD =.;
IF SY39 NE . AND SY39AE GT 2 THEN SY39AE =.;
IF SY39 NE . AND SY39AF GT 2 THEN SY39AF =.;
```

Reversing Items Prior to Scale Formation

The original scoring of the variables was not always in the direction of independent living. The n- prefix was added to each variable to indicate it had been reversed (see Appendix E for more information on reversed items). The following variables were reversed to facilitate interpretation:

```
NSBB027A = SBB027A  * -1;
NSBB027B = SBB027B  * -1;
NSBB027C = SBB027C  * -1;
NSBB027D = SBB027D  * -1;
NSBB027E = SBB027E  * -1;
NSBB024A = SBB024A  * -1;
NSBB072D = SBB072D  * -1;
NSSY3C   = SSY3C    * -1;
NSSY15   = SSY15    * -1;
NSSY13B  = SSY13B   * -1;
NSBB062D = SBB062D  * -1;
NSBB065B = SBB065B  * -1;
NSBB071A = SBB071A  * -1;
NSSY3G   = SSY3G    * -1;
NSSY55   = SSY55    * -1;
NSBB072E = SBB072E  * -1;
NSBB065D = SBB065D  * -1;
NSBB071E = SBB071E  * -1;
NSY35A81 = SSY35A81 * -1;
NSY35B81 = SSY35B81 * -1;
NSY35A82 = SSY35A82 * -1;
NSY35B82 = SSY35B82 * -1;
NSY35A83 = SSY35A83 * -1;
NSY35B83 = SSY35B83 * -1;
NSSY4K   = SSY4K    * -1;
NSSY34B  = SSY34B   * -1;
NSSY34C  = SSY34C   * -1;
NSSY37A  = SSY37A   * -1;
NSSY37B  = SSY37B   * -1;
NSSY37C  = SSY37C   * -1;
```

```
NSSY37D  = SSY37D   * -1;
NSBB057H = SBB057H  * -1;
NSFY79   = SFY79    * -1;
NSYB053A = SYB053A  * -1;
NSYB053B = SYB053B  * -1;
NSYB053C = SYB053C  * -1;
NSYB053D = SYB053D  * -1;
NSYB053E = SYB053E  * -1;
NSYB053G = SYB053G  * -1;
NSYB079  = SYB079   * -1;
NSBB092  = SBB092   * -1;
NSSY9B   = SSY9B    * -1;
NSSY9C   = SSY9C    * -1;
NSSY9D   = SSY9D    * -1;
NSSY9E   = SSY9E    * -1;
NSSY9F   = SSY9F    * -1;
NSNEW3   = SNEW3    * -1;
NSYB054A = SYB054A  * -1;
NSYB054B = SYB054B  * -1;
NSYB054C = SYB054C  * -1;
NSYB054D = SYB054D  * -1;
NSYB054E = SYB054E  * -1;
NSYB054F = SYB054F  * -1;
NSNEW1   = SNEW1    * -1;
NSNEW5   = SNEW5    * -1;
NSBB061E = SBB061E  * -1;
```

Notes

[1] The Duncan index is an ordinal measure of the prestige of an occupation, developed from the responses of a sample of the U.S. population in 1947 to questions about the prestige of 45 selected occupations. Data in the 1950 census were converted to two summary measures, reflecting for each of the 45 occupations (a) the proportion of male workers in 1950 with educational attainment of four years of high school or more, and (b) the proportion of males with income of 3,500 or more in 1949 (Duncan, 1969).

[2] According to the Center for Statistics, students who identified themselves as having visual handicaps appear to be overrepresented in the sample. This may be the result of a general misinterpretation on the part of students, many of whom may have only had mild visual problems correctable by glasses or lenses. The Center for Statistics advises caution in the use of this category.

[3] Occupation and industry were coded according to the U.S. Department of Commerce, Bureau of the Census, Classified Index of Industries and Occupations, 1970 and the U.S. Department of Commerce, Bureau of the Census, Alphabetical Index of Industries and Occupations, 1970. The 1970 edition was used so that the coding on HSB would coincide with that used on The National Longitudinal Study of the High School Class of 1972. The codes can be found in Appendix C.1 of the HSB (1984) Users' guide.

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